PULP & PAPER

SEPTEMBER 1959

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Purchased Chip Use Grows
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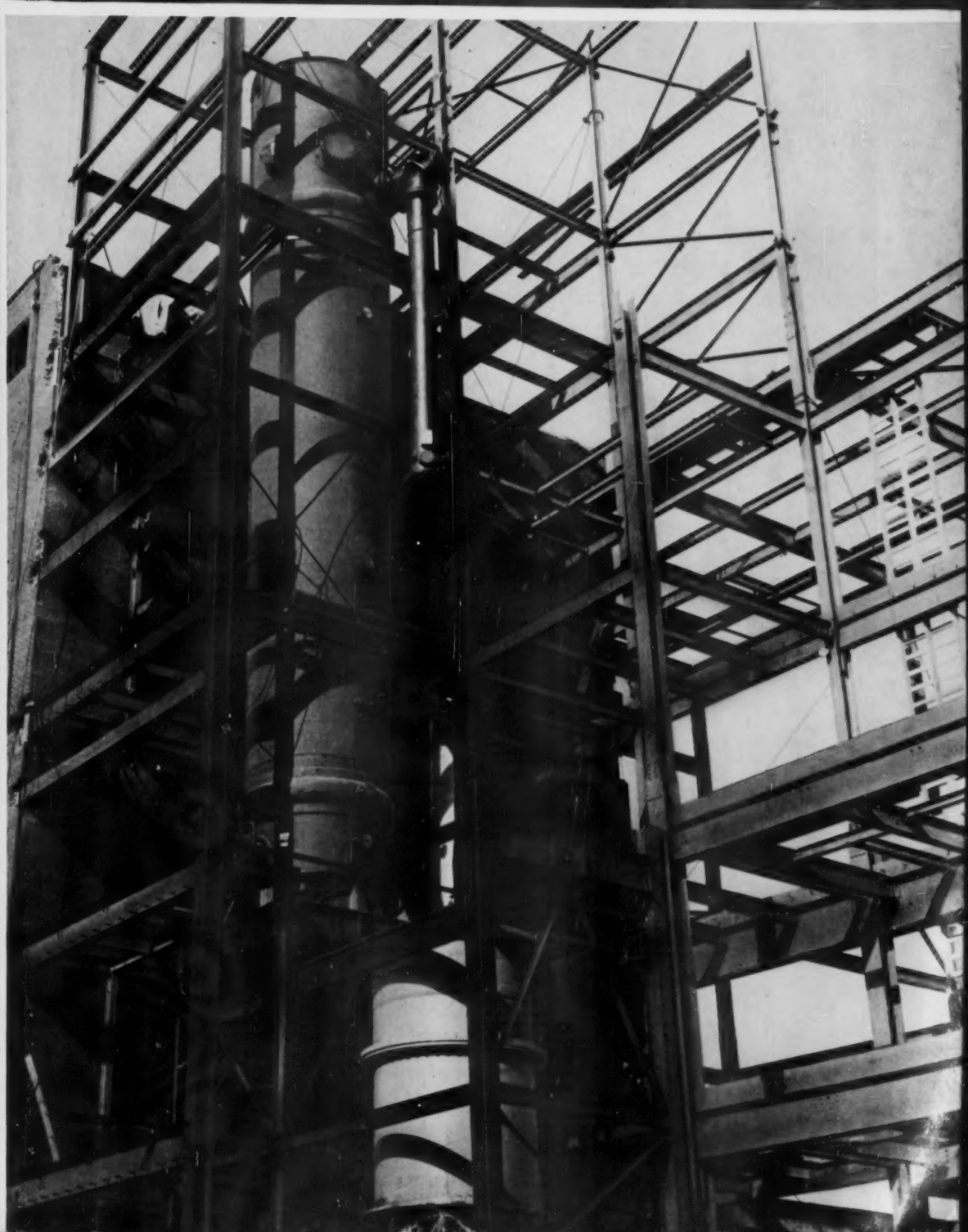
A New Upflow Continuous Digester at Hammermill Paper Co.

Background—Neutracel Bleach Plant)

see page 77



. . . means more to papermakers than any steel developed in two decades

Its unique properties provide: absolute resistance to corrosion from chemicals normally encountered in refining equipment — protection of the cutting edges against wear and abrasion — toughness to withstand deformation without fracture — and the capacity to resist severe shock.

The need for a metal with this combination of mechanical properties has long been felt. Before the first shipments of Bolton Special Stainless were made in 1948, the choice was between wear resistance or corrosion resistance. Now, The Papermaker gets both, in addition to all other necessary properties.

Bolton Special Stainless is a chrome-nickel alloy having a chrome and nickel content approximating that in 300 series Stainless. It has made possible a form of heat-treating never before used commercially on steel for refining equipment. Known as precipitation hardening, this in-plant custom heat-treating gives the finished steel the unique character of being entirely free of stresses. This Bolton heat treatment makes it practicable to control the relationship of mechanical properties of the metal to meet the specialized requirements of paper mill refining operations.

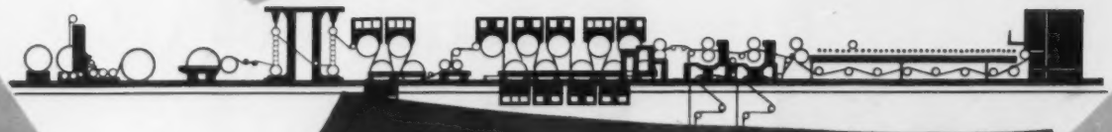
Brinell Hardness	Tensile Strength (Average Minimum)	% Elongation (2")	% Reduction of Area
321	180,200	16.4	74.2
363	199,300	14.5	41.9
415	211,700	14.0	32.1

Various heat treatments for differing mill applications

It has taken years to prove this metal under all operating conditions. Now we have standardized our inventories on Bolton Special Stainless. We are proud to offer this premium quality stainless at no additional cost. Bolton Special Stainless is on hand in quantity to make prompt shipments to the growing number of papermakers *who have compared* — in all patterns, in all makes of Jordans. Don't wait. Try it now. *Call or write John W. Bolton & Sons, Inc., Lawrence, Massachusetts.*

BOLTON EMERSON

56 DRYERS



14 DRYERS

The two paper machines sketched above are identical in production and quality of product.

The Rice Barton Gardner Dryered machine requires less space, costs less to install, and costs less to operate.

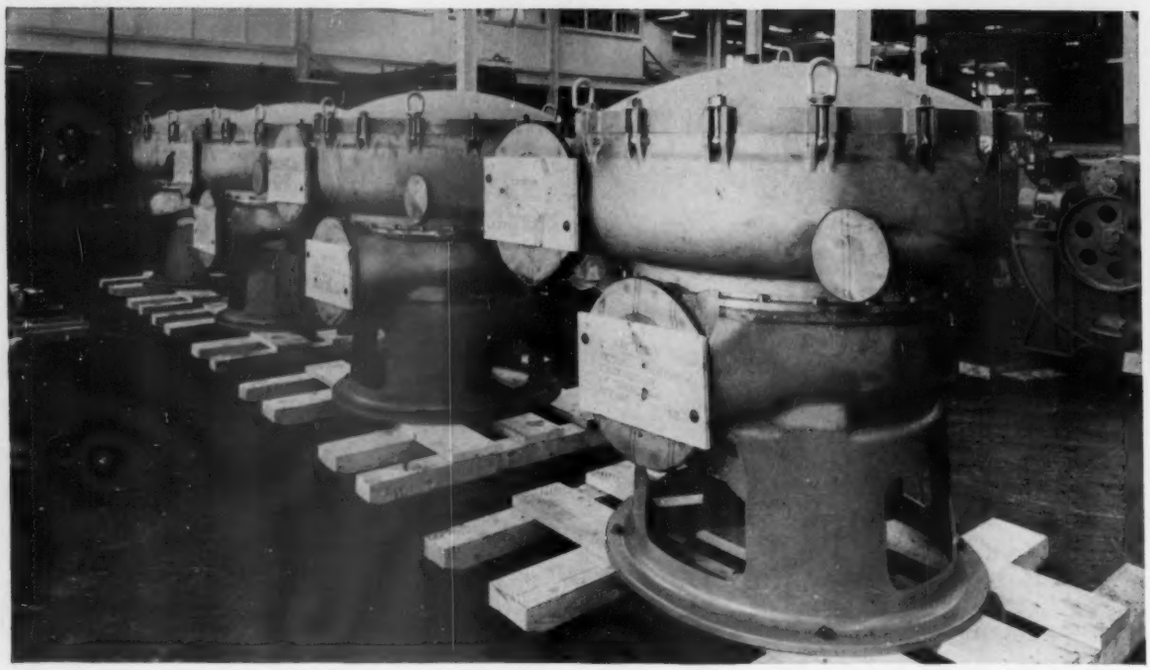
If you are thinking about a new paper machine, look into the only truly modern paper machine on the market.

RICE BARTON

RICE BARTON CORPORATION

WORCESTER, MASSACHUSETTS U. S. A.

Paper Machinery Builders Since 1837



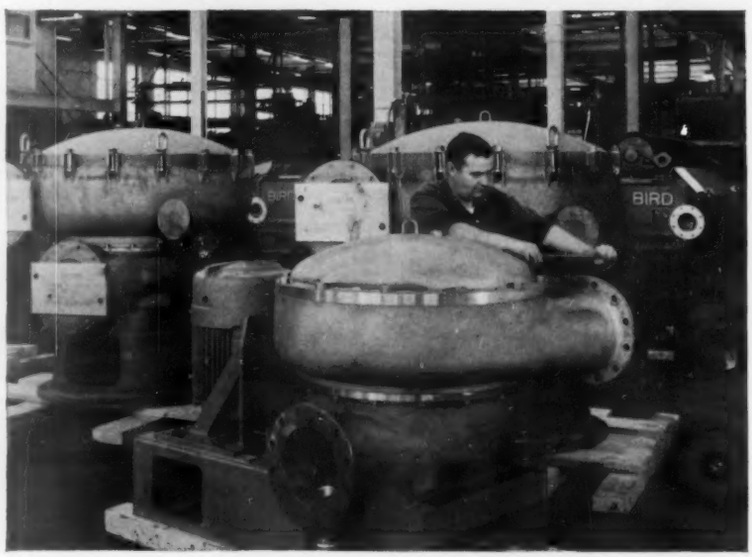
Sincere Compliment To A Great Industry

These pictures of Bird Centriscreens, being readied for shipment (showing both the Model 14 for screening up to 5600 gpm and the Model 10 for Fourdrinier or Cylinder machines requiring less volume) are representative of the extraordinary demand for Centriscreens that has been built up in a few short months.

This is not so much a tribute to the skill of the men who designed and built the Centriscreen (for, after all, they enjoyed the benefit of fifty years of unequalled experience in the manufacture and application of pulp and paper screening equipment) as it is a tribute to the industry itself. For no other industry is more alert to new developments — quicker to take advantage of significant advances in production quality, output and economy.

Once the Bird Centriscreen demonstrated its ability to do a better job of shive and dirt removal, screen more stock per day at lower cost per ton, and assure freedom from mechanical troubles and from screen plate breakage, it was immediately accepted. The record of orders and repeat orders from mills making almost every kind of paper proves that.

If you are not already fully informed on the Centriscreen, what it can do on *your* stock, how much it can save — let Bird Machine Company, South Walpole, Mass., provide recommendations, layouts and estimates. Then decide for yourself.



PULP & PAPER

Reader's Guided Tour

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NUMBER 10

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Better Quality Control 61

Take some twenty quality control experts, ask them some leading questions and you will get more than twenty leading answers. That is just what PULP & PAPER did to get this "Blue Ribbon" panel on Quality Control. Some interesting answers from the customer's viewpoint, too.

Inside a Russian Mill 68

Editor A. W. Wilson takes you inside a six-machine condensing paper mill in Russia, just south of Leningrad. His report includes many pictures of equipment and of workers, many of them women—including lady machine-tenders! How workers are rewarded for good work and other details are given in this unusual article.

New Continuous Upflow Digester 77

This is a real PULP & PAPER special. Here, for the first time, is the full and exclusive report on successful commercial operation at Hammermill Paper Co. of the new Impco continuous digester. Using the upflow principle and mixed hardwoods, this digester produces uniform NSSC pulp for Hammermill's fine paper grades, with good brightness, good strength, and—what's more—continuous pulp produced in a more highly refined state.

Canadian Newsprint Mills' Merger 85

Considerable excitement rippled across the industry at news about plans to unite two forest giants—Powell River and MacMillan & Bloedel. In newsprint alone, their combined capacity is more than 725,000 tons per year, making them king of the newsprint industry.

Progress in Wood Utilization 139

No longer content to "let the chips fall where they may, pulp and paper companies are very careful about this important source of prime fiber—and West Virginia Pulp and Paper Co.'s R. W. Parnell tells why they, too, like purchased chips.

CIRCULATION DEPT., 500 Howard St., San Francisco 5, Calif. C. C. Baake, Circ. Mgr. Send subscription orders and changes of address to PULP & PAPER, above address. Include both old and new addresses.

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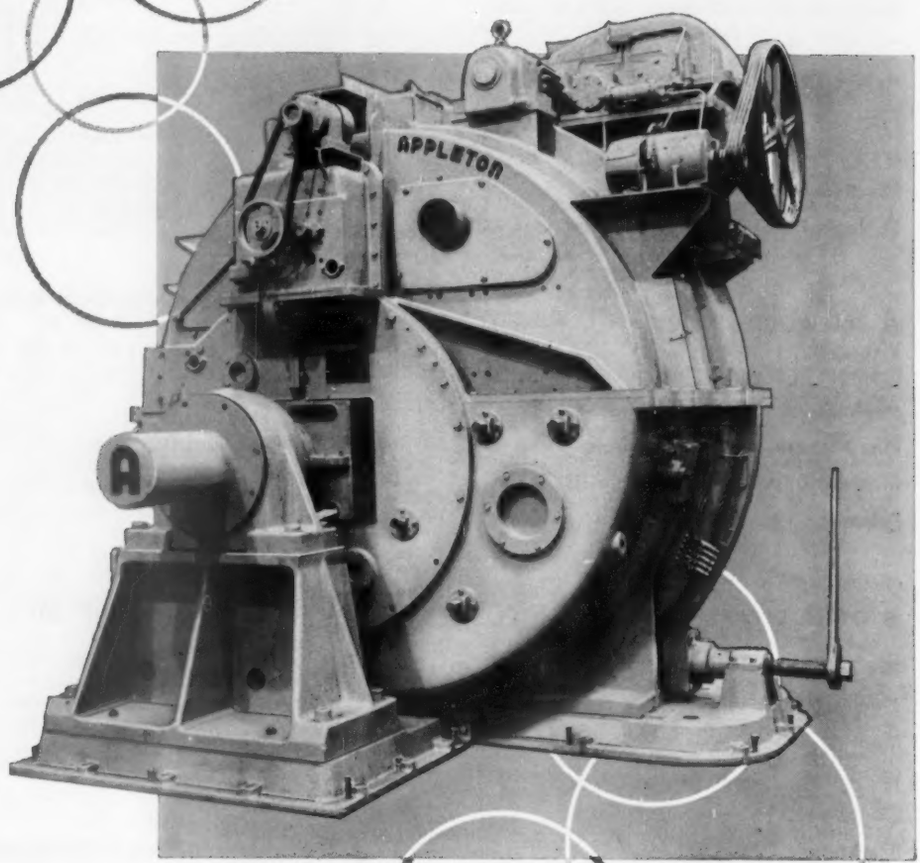
— the original builders of Roberts grinders and the oldest hand in the business presents, reasonably enough, the industry's . . . .
NEWEST RING-TYPE GRINDER



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The APPLETON grinder features *new* features and heavier components . . . *delivers* more horsepower for greater production . . . is especially adaptable to automatic feeding . . . has conclusively proved its superiority in mill operation.

Complete details will be sent promptly upon request. Available on lease-purchase plan, if desired.

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The Editor Reads His Mail

Address letters to The Editor, PULP & PAPER, 1791 Howard St., Chicago 26, Ill.

Straight-Forward Reports

Editor: I have enjoyed very much your excellent articles on your visit to the Soviet Union. Straight-forward reporting is not too easy to find on the Soviet Union economy these days, so your account is most welcome. I intend to draw from it, and from your WORLD REVIEW NUMBER, for my course in "Comparative Economic Systems," at Lake Erie College this Fall. More power to your pen.

RUTH SHALLCROSS MAYNARD
Consulting Economist and Lecturer on Economics, The Institute of Paper Chemistry, Appleton, Wis., U.S.A. (formerly research associate there.)

Russian Progress Report

—New York City.

Editor: Have just read for the second time your report from Russia on the paper industry in that country. You must have had a most interesting experience. I must say the paper industry has advanced further in that country than I had realized.

FRANK H. BRIGHAM,
Research Director,
Cyrus J. Lawrence & Sons

From a London Reader: "Factual Report on Russia"

—London

Editor: I have been reading with great interest your report on your Russian visit and I must congratulate you on your factual and objective writing. I am sure if the press of all our countries would take a lesson from such reporting it could do nothing but good.

J. F. S. MODDREL,
Managing Director
Kopparsfors (London) Ltd.

MEETING DATES CALENDAR

September 1-3
New York-Canadian Division PIMA
Chantecler Hotel, St. Adele, Que.

September 9-11
Northwestern Division PIMA
Hotel Leamington, Minneapolis, Minn.

September 10-12
Wood Industries Conference (sponsored by the American Society of Mechanical Engineers, the Forest Products Research Society and the American Institute of Chemical Engineers)
Multnomah Hotel, Portland, Ore.

September 9-11
Fundamental Research-Wet Strength Conference
Institute of Paper Chemistry, Appleton, Wis.

September 15-17
9th TAPPI Corrugated Containers Conference
Jung Hotel, New Orleans, La.

September 21-23
14th TAPPI Paper-Plastics Conference
Edgewater Beach Hotel, Chicago, Ill.

October 8-9
Fourteenth Deinking Conference
Roger Smith Hotel, Holyoke, Mass.

October 8-10
Pa.-N.J.-Del. Division, PIMA
Traymore Hotel, Atlantic City, N.J.

October 12-15
14th TAPPI Engineering Conference
Penn-Sheraton Hotel, Pittsburgh, Pa.

October 14-16
Southern-Southeastern Division, PIMA
Edgewater Gulf Hotel, Edgewater Park, Miss.

October 26-28
Packaging Institute
Statler Hotel, New York, N.Y.

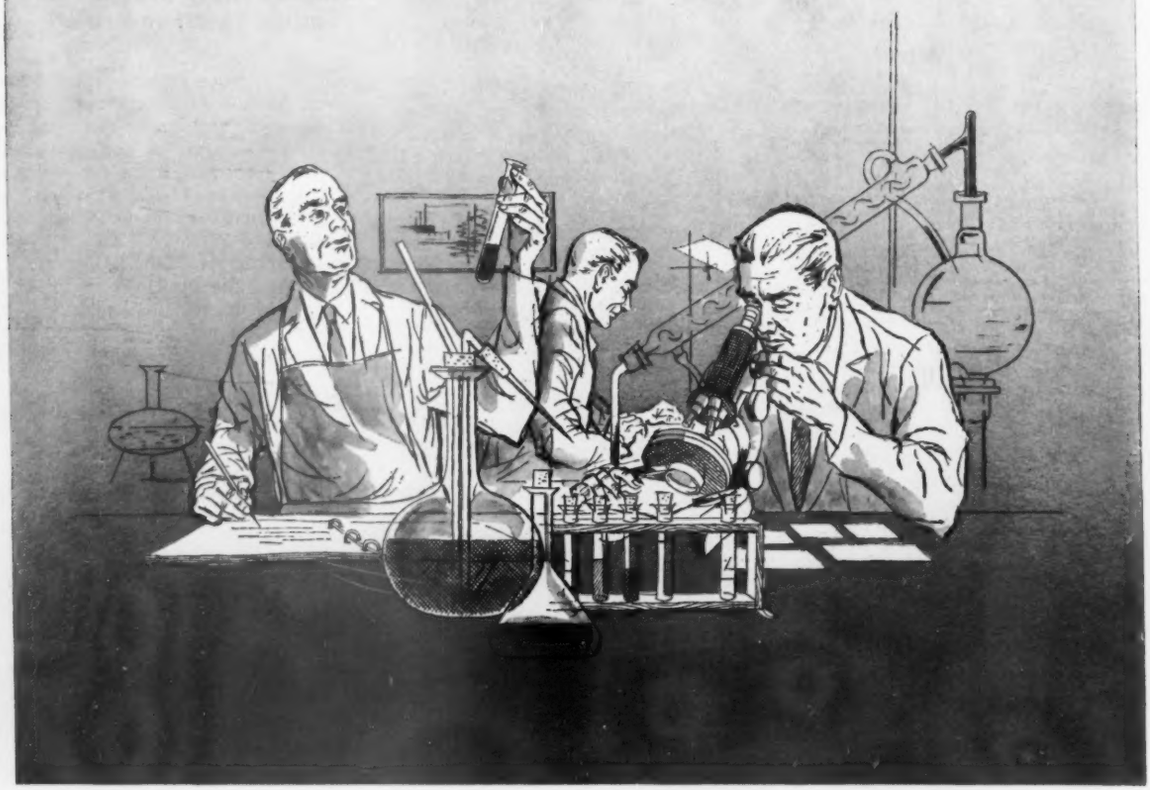
November 4-6
TAPPI Alkaline Pulping Conference
Robert Meyer Hotel, Jacksonville, Fla.

November 9-10
National Paperboard Association
New York, N.Y.

December 1-2
Pulp, Paper and Paperboard Industrial Waste Conference
Edgewater Beach Hotel, Chicago, Ill.

January 26-29, 1960
Technical Section, Canadian Pulp & Paper Association
Queen Elizabeth Hotel, Montreal, Que.

YOU GET TECHNICAL SERVICE



...when Gottesman enters the picture! The Gottesman Organization knows what is important in pulp... including your production problems. Technicians on the staff of our pulp suppliers stand ready to assist our customers whenever necessary. This is but one of the many "fine points" of service we provide!

Established 1886

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PULP PAPER EXPORT

Gottesman & Company Aktiebolag, Stockholm, Sweden
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Representatives in 55 Leading World Markets

MONTHLY REPORT – WORLD NEWS

SWEDISH MARKET STABILIZED . . . says a spokesman for forest owners. The market situation is steadily improving. Demand for sawmill products has increased somewhat, while pulp and paper sales have held steady following some price reductions and output adjustments. Shipments of pulp and paper have been relatively large, and prices are not expected to rise. Capacity, however, is still somewhat larger than consumption.

TECHNOLOGICAL IMPROVEMENTS HAVE REDUCED COSTS . . . of newsprint despite increased wages, according to the Newsprint Information Committee, New York, N. Y., U. S. A. While wage costs have climbed 78% for mill workers and loggers during the past 10 years, cost reductions effected by mechanized logging saved $5.50 per ton, and by mill improvements $20.00 —a total of $25.50 in savings.

INDIAN PAPER PRODUCTION . . . during 1959 is now estimated at 250,000 tons, an increase of 40,000 over 1958.

MORE THAN $10,000,000 . . . will be spent by Scott Paper Co. to increase the capacity of its Mobile, Ala., U. S. A. mill from 170,000 tons to 240,000 tons/year.

GENERAL IMPROVEMENT IN GERMAN ECONOMIC CONDITIONS . . . has brought an increase in orders to paper and board mills. Business is considerably above the average in spite of pressing competition from abroad. German wood pulp production, however, remains unfavorable.

VISITORS TO THE AMERICAN EXHIBIT IN MOSCOW . . . during July were handed a guide book printed entirely in Russian with the exception of the scrawled signature "Dwight D. Eisenhower" inside the front cover and "The Champion Paper & Fibre Co., Hamilton, Ohio, U. S. A." on the back. Champion underwrote the cost of 100,000 copies.

CANADA-RED CHINA AGREEMENT OFF . . . Although it seemed a few months ago that some Canadian pulp would be sold to Red China, all deals are off, and there is little prospect of any such sales in the early future, according to W. E. Breitenbach, executive vice pres. of Alaska Pine & Cellulose Ltd.

BRITISH PRODUCTION UP . . . For the second quarter of 1959 output of paper stood at 652,838 tons as compared to 610,714 in the second quarter of 1958. Board production was 275,238 tons, up from the 256,429 of the year before.

NEW MEXICAN PAPER MILL . . . in operation at Ayotla, where Fabrica de Papel Mexico SA has recently finished construction of a plant adjacent to the existing pulp mill. Normal production is reported.

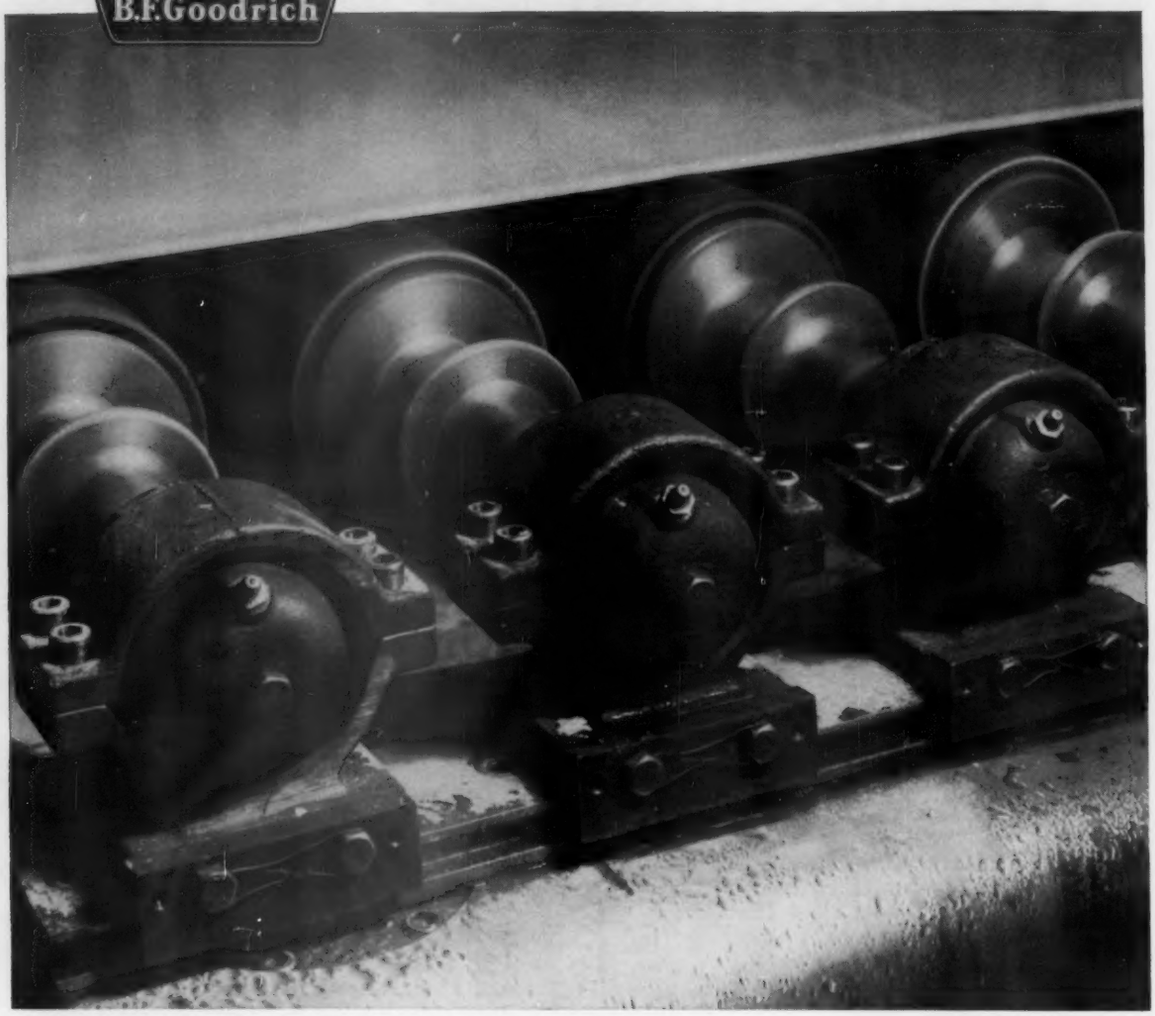
U. S. A. IMPORTS VARIED . . . This year so far newsprint has been received from Poland, parchment from Austria, bleached sulfite paper from South Africa, photographic paper from West Germany, insulating board from Israel, hardboard from Japan, wallboard from Surinam and pulpwood from the Bahamas.

INDUSTRY REGAINS HIGH OPERATING LEVELS says John R. Kimberly, president and chairman of Kimberly-Clark Corp. The official of the Neenah, Wis., U. S. A. firm continues: "After a two-year adjustment, the underlying demand for output is strong." For his company he predicts record sales and earnings in 1959 and "continued substantial growth." K-C has spent more than $115,000,000 in capital expenditures in the past five years and in fiscal 1959-60 will spend an additional $24,000,000.

JAPANESE IN ALASKA . . . with a pulp mill (Alaska Lumber & Pulp Co. Inc.) at Sitka, are reported bidding on a new power project for the City of Sitka. The plant will furnish some power to the Alaska Lumber & Pulp mill.

U. S. A. ADVERTISING VOLUME ON INCREASE . . . according to figures recently released by Printers' Ink. Increase for May was 10% above 1958. Newspapers are leading the field with a 15% gain, general magazines were up 11%, and business papers showed a boost of 7%.

B.F.Goodrich



Some rolls wobble instead of roll

—and those that do spoil the formation of the sheet. You'll never have this problem with B.F.Goodrich Dukbak table rolls. That's because they're dynamically balanced to prevent whipping, even at high speeds. Rolls that are perfectly balanced run longer between recoverings. The sheet they help produce is smooth and uniform.

B.F.Goodrich Dukbak rolls shed water fast, throw it down and away. There's no danger of water spray returning to the wire and spotting the sheet. These rolls can run at speeds up to 1000 feet per minute without deflectors, so water removal is faster, much more efficient.

In addition to better performance, B.F.Goodrich Dukbak table rolls have many other cost-saving advantages. Cover separation is impossible because the rubber is locked to steel by the patented Vulcalock process, the strongest rubber-to-steel adhesion known today. There's no danger of corrosion because the ends are sealed against moisture. And, after years of hard service, Dukbak rolls can be reground as good as new.

Let a B.F.Goodrich man show you how these longer-lasting rolls can improve the quality of your paper. And if you are buying a new fourdrinier or having one rebuilt, be sure to specify B.F.Goodrich Dukbak rolls to your machine builder. *B.F.Goodrich Industrial Products Company, Department M-624, Akron 18, Ohio.*

B.F.Goodrich *paper mill rolls*

MONTHLY REPORT – WORLD NEWS

REDUCTIONS IN BRITISH INCOME AND PURCHASE TAXES . . . are expected to bring with them an increased consumption of paper and board during the second half of 1959.

RESISTANCE TO WATER AND HIGH HUMIDITY . . . is reported for a new corrugated box recently announced by Federal Container Corp., Minneapolis, Minn., U. S. A. The boxes are being marketed under the trade name Dri-Bak.

GREAT BRITAIN'S PRINTING DISPUTE . . . was settled recently after a six-week walkout. More than 1,000 local newspapers and 4,300 printing firms were affected by the dispute. Some 2,500 workers were on strike in the printing ink industry.

MORE ON ESPANOLA, ONT. EXPANSION . . . where KVP Co. Ltd. is boosting its capacity by 15,000 tons per year. Project calls for a new 136-in. combination Yankee paper machine, a complete stock preparation system and a Flexiblade off-machine coating unit. Production will consist of machine-glazed and machine-finished papers. Manufacture of equipment will be shared by Black-Clawson facilities in Canada, the United Kingdom and the United States.

TREMENDOUS GROWTH IN PAPERBACK PUBLISHING . . . was cited by New York & Pennsylvania Co. Inc. (New York, N. Y., U. S. A.) when it announced its enlarged line of papers for both cloth-bound and paperback books. Because of the economies involved in this field, rotary presses are being used more and more, and the demand for web-offset papers increases daily.

U. S. PULP INDUSTRY HEADED FOR RECORD HIGH . . . but on a highly selective basis. Some sectors are not participating fully in these boom times, says Lawson P. Turcotte, president of Puget Sound Pulp & Timber Co. He reports that national production of all grades of wood totaled 10,029,000 tons in the first five months, up sharply from the 8,805,000 of the same months of 1958 and considerably above the 9,433,000 of 1956, when the previous record was set. National consumption is also at a new high: 10,803,000 tons for the five months. Most of these gains are in the sulfate and dissolving pulp classifications. Sulfide pulps are barely above 1958 and not up to 1956.

FINNISH PRODUCTION DOWN . . . During the first five months production of viscose pulp was lower than a year ago. Shipments, however, have continued in a generally unchanged volume. Consequently, the stock situation has improved somewhat.

NEW HIGH FOR U. S. A. PAPERBOARD . . . production for the first six months was 16.6% greater than the comparable period of 1958. Average weekly shipments through June 27 were 306,700 tons. According to the National Paperboard Assn., if the present rate continues 1959 will be a record year with 15,900,000 tons of paperboard produced.

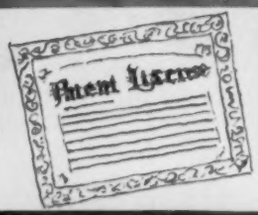
30,000-TON CAPACITY INCREASE . . . planned for the LaTuque, Que. mill of Canadian International Paper Co. The $10,000,000 expansion program is set for completion in early 1961. In addition to a new paper machine, the company will install a laminating unit that will permit the production of heavier bleached board.

CANADIAN FIRM RETAINED FOR SWEDISH PROJECT . . . Sandwell & Co. Ltd., Vancouver, B. C. engineering organization, has been engaged by Svenska Cellulosa AB in connection with a new kraft linerboard machine and expansion of pulp and paper facilities at Munksund.

ST. REGIS PAPER CO.'S NEW EXTENSIBLE PAPER . . . to be known as Duostress heralds further moves in this relatively new field. . . . Meanwhile, the third U. S. A. paper machine to produce Clupak extensible paper has been started up by International Paper Co. at its Camden, Ark. plant. (Two units are in operation at the Charleston, S. C. mill of West Virginia Pulp & Paper Co.)

GREATER AMERICAN PRIVATE INVESTMENT . . . in the world's under-developed area will increase the market in these regions for American exports, says John L. Connolly, gen. counsel for Minnesota Mining & Mfg.

Which of these 3 products and services can you use from BECCO?



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Well, perhaps there's a little more to your gaining use of Becco patents than just mailing your dollar in, but not much more. And certainly, no more money. The $1.00 really does cover it.

Becco has lots of patents, granted as a result of innovations in the use of Hydrogen Peroxide and other Peroxygen chemicals developed in Becco's Research Laboratories. But they don't do us a whole lot of good locked tightly in our safe. So, we long ago adopted the following policy:

If one of our patents can help you, we'll be glad to license the rights to you **perpetually**, for just one dollar. You get a nice certificate, incidentally, to cover the legalities, but more important — you also get free our complete engineering help in setting up your process, handling the material, maintenance, etc., etc.

What do **we** get? You as a **customer** — we hope — but there's no obligation on your part. Just seems to work out that way, though — when we know enough about a particular peroxygen to hold a patent on its use, chances are we've also learned enough to produce it purer than anyone else. You benefit from this; we do, too.

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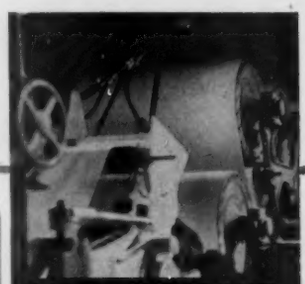


How BRIGHT Is BRIGHT?

That's a hard question to answer. It depends on how the pulp is treated.

Trouble is, paper can show an 86 level at the layboy, but by the time the paper is delivered, this has dropped to 82 or lower. With conventional bleaching methods, that is.

Many chemical pulp producers have found the answer to this problem in Becco's Dryer Steep Bleaching Process (patented, but licensed perpetually for one buck). Applied by means of spray pipes across the pulp sheet ahead of the dryers, Becco Hydrogen Peroxide increases brightness permanence and bleaches in transit. Often, in fact, an 86 layboy level **improves** to 88 by delivery time.

This is just one example. Becco has a vast amount of technical knowledge compiled from 31 years of experience with **all** types of pulp. If **you'd** like help with your pulp, free of any obligation, let us know with the coupon below.

BECCO fmc

BECCO CHEMICAL DIVISION, FMC
Station B, Buffalo, New York
Dept. PP-C

Gentlemen:
We **would** like help with our pulp. Please have a Becco Sales Engineer call.

NAME_____
FIRM_____
ADDRESS_____
CITY_____
ZONE____ STATE_____

Problems in handling Hydrogen Peroxide

Becco's Four-Fold Engineering Service Program — offered free — includes:

1. Comprehensive survey of your facilities.
2. Specific proposal with recommendation of proved equipment and where it is obtainable.
3. Installation supervision by Becco.
4. Periodic inspection and permanent service.

Can you use this free Becco help, based on more years of experience with bulk handling of H_2O_2 than any other manufacturer? Use the coupon to let us know.

BECCO fmc

BECCO CHEMICAL DIVISION, FMC
Station B, Buffalo, New York
Dept. PP-B

Gentlemen:
Please tell me more about your Four-Fold Engineering Service.

NAME_____
FIRM_____
ADDRESS_____
CITY_____
ZONE____ STATE_____

MONTHLY REPORT – WORLD NEWS

ALASKAN NEWSPRINT MILL INTEREST IS "ASSURED" . . . if a $40,000,000 power plant now under consideration by the government is completed by July 1964. In an interview with PULP & PAPER, James L. Buckley, president of Georgia-Pacific Alaska Co., stated that the plant size is undetermined. The mill would be built at Juneau.

NEW MACHINE FOR PINE BLUFF, ARK. . . . where International Paper Co. will install a 209-in. Beloit unit in a $13,000,000 expansion program. Production will be in lightweight directory and groundwood printing grades. Work will include groundwood mill expansion and installation of additional recovery facilities.

NO. 6 ON THE LINE . . . at Northwest Paper Co.'s Brainerd, Minn. mill. The new Beloit Iron Works Fourdrinier was dedicated at ceremonies in August. The machine—with a 200-in. wire—operates at speeds of up to 2,000 fpm on a wide range of high-grade printing, writing and converter type papers. (See story this issue.)

BELOIT MACHINE FOR WAUSAU PAPER MILLS . . . at Brokaw, Wis., was first announced at the company's recent Diamond Jubilee Family Days. The unit is being engineered and will be delivered in 1961.

IN WHAT IS REPUTED TO BE ONE OF THE LARGEST PURCHASES . . . in the Pacific Northwest forest products industry, Georgia-Pacific Corp. through its newly formed Georgia-Pacific Timber Co. of Springfield, Ore., U. S. A. The price was said to be in excess of $91,000,000. Objective: the more than 3 billion ft. of merchantable timber and the upwards of 143,000 acres of timberland owned by B-K.

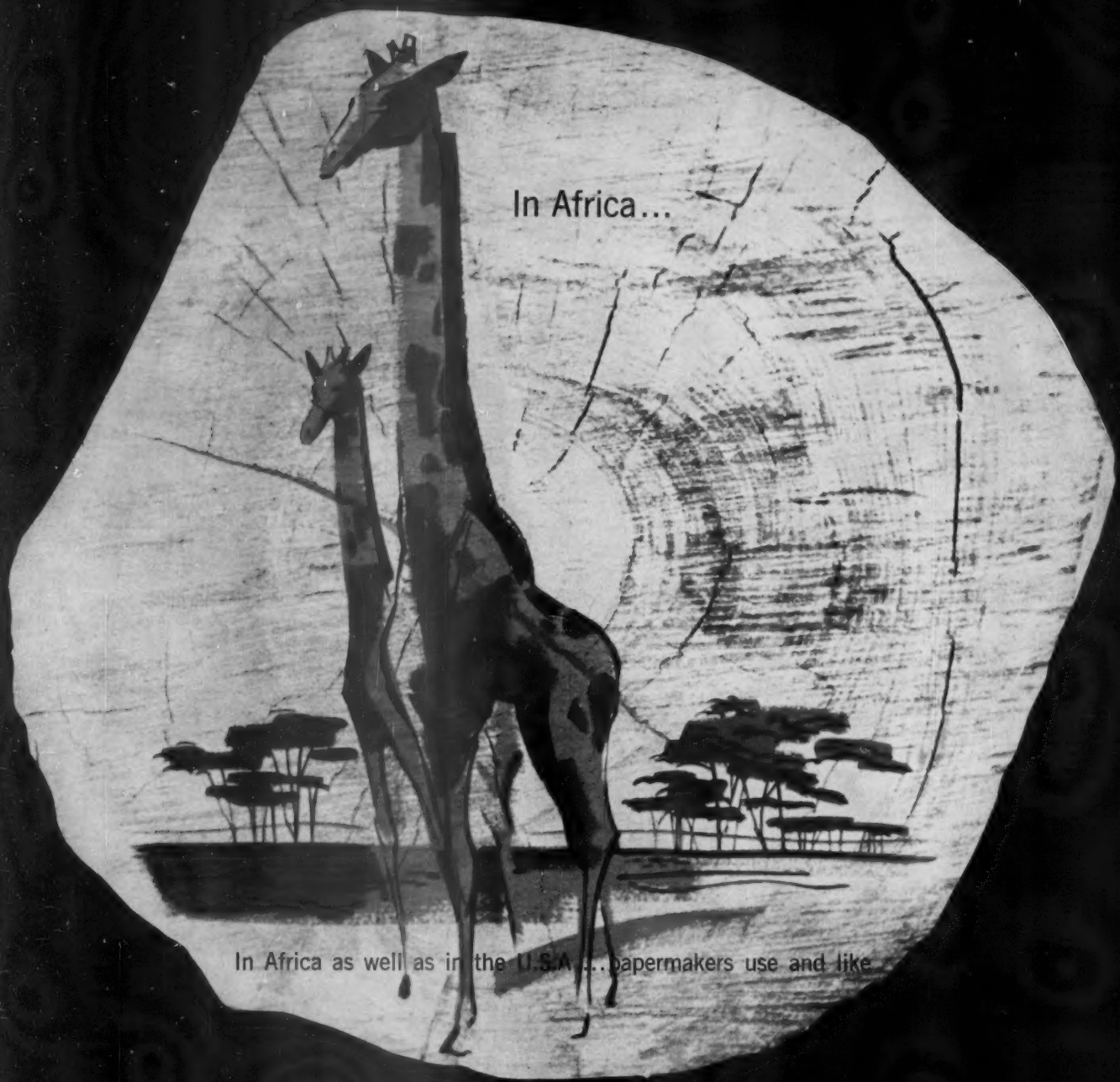
SIMPSON, LEE MERGER HERALDS NEW MILL . . . near Modesto, Cal., U.S.A. Officials of Simpson Paper Co., Everett, Wash., and Lee Paper Co., Vicksburg, Mich., have approved merger of the two firms into Simpson Lee Paper Co. The new company expects to build the $7,000,000 mill within the next two years. A 200-acre site has been purchased.

HOPSCOTCHING THE NORTH AMERICAN INDUSTRY . . . Construction has begun on a major remodeling project to house a new paper machine at the Nekoosa, Wis. mill of Nekoosa-Edwards Paper Co. The new machine—largest of the firm's 11 production units—will be built by Beloit Iron Works to produce a daily 170 tons of fine papers. . . . Fibreboard Paper Products Corp. is constructing an integrated shipping container plant at Phoenix, Ariz. Completion of the plant—heart of which will be an 85-in. corrugator—is set for the end of the year. . . . Also at Phoenix, the Container div. of International Paper Co. is building a new corrugated box plant. . . .

Agreement has been reached (subject to approval by directors and stockholders) for the merger of Calaveras Cement Co., San Francisco, Cal., into Flintkote Co. . . . Shipments of corrugated and solid fiber boxes were 15.9% higher during the first six months of 1959 than in the same period last year. . . . Formation of Packaging Corp. of America has been announced with the formal merger of American Box Board Co., Grand Rapids, Mich., Central Fibre Products Co., Quincy, Ill., and Ohio Boxboard Co., Rittman, Ohio.

NORTH AMERICAN NEWS BRIEFS. . . . Longview Wash., U. S. A., will install a 50-ton Beloit Iron Works machine for the production of toweling, creped specialties and lightweight kraft papers at speeds of up to 1,500 fpm. Completion is expected in the spring. . . .

Bestwall Gypsum Co. will undertake an extensive modernization and improvement program at its Pryor, Okla. paper and felt plant. . . . Champion Paper & Fibre Co., Hamilton, Ohio, has purchased Wertgame Paper Co., Kansas City, Mo. paper merchandiser. . . . The Ohio firm has also leased a 72,000-sq. ft. building near Waynesville, N. C., where an expanded line of small business papers will be processed and packaged. . . . St. Regis Paper Co. has proposed an exchange of its common shares for the capital stock of Cornell Paperboard Products Co., Milwaukee, Wis.



ALBACEL & ASTRACEL

CHLORINE DIOXIDE BLEACHED SOFTWOOD SULPHATE

CHLORINE DIOXIDE BLEACHED HARDWOOD SULPHATE

Balanced Paper-Grade Pulps Created by Papermakers for Papermakers

RIEGEL PAPER CORPORATION

260 MADISON AVENUE, NEW YORK 16, N. Y.

Hydrotropic Digestion of Plant Materials

Jayme, Georg, and Rosenstock, Karl-Heinz. Wochbl, Papierfabrik. 86, 23/24: 1009-18 (Dec., 1958), [In German] Abstr. Bull. I.P.C. 29): 1197-8.

The principles and mechanism of hydrotropic pulping are outlined, and the literature on this topic is reviewed, with detailed attention to the work of R. H. McKee (U. S. patent 2,308,-564). Systematic investigations on the influence of cooking time (at 160 and 175°C.) and pressure (at 175°) on the hydrotropic digestion of depithed bagasse with 30% (by weight) of naxonate (sodium xylenesulfonates) are reported. The majority of lignin is removed within 30-120 min. (depending on temperature); prolonged digestion causes strong dissolution of hemicelluloses, thus producing pulps of high alphacellulose content but having low strength properties without essentially improving the delignification process. Because the organic acids formed during hydrotropic pulping (and the resulting lowering of pH) favor the hydrolytic degradation of hemicelluloses while hindering the delignification of bagasse, their neutralization by addition of sodium hydroxide to the naxonate solution was expected to improve the hydrotropic processs. In fact, this measure led to the production of bagasse pulps having strength properties comparable to those of bagasse kraft pulps. Paper chromatography of the spent digestion liquor showed presence of xylose in amounts depending on cooking time.

Aging of Viscose

Schurz, J., and Armbrüster, W. Holzforschung 12, no. 5: 129-35 (Nov., 1958). [In German; English summary] Abstr. Bull. I.P.C. 29: 1124.

The ripening of a viscose solution containing 4% cellulose and 15% sodium hydroxide was investigated. The kinetics of the aging process seemed to follow a second-order reaction, the kinetic constants corresponding to those of a saponification reaction. The distribution of the gamma-number was largely influenced by the distribution of D.P. Plotting the D.P. against gamma-number gave horizontal lines for well-aged viscoses and steeply sloping curves for slightly ripened viscoses.

Presented with permission of The Institute of Paper Chemistry, under supervision of Curtis L. Brown, editor of IPC Bulletin. Photostats or translations of original reports available at reasonable cost by writing Eugene Bunker, librarian, Institute of Paper Chemistry, PO Box 498, Appleton, Wis., U.S.A.

Groundwood from Chips

Kossoí, A. S. Bumazh. Prom. 33, no. 10: 6-9 (Oct., 1958). [In Russian] Abstr. Bull. I.P.C. 29:1160.

In a study of the effect of process variables on the composition and properties of groundwood from chips, birchwood and mixtures of birch and sprucewood chips were pretreated with a liquor containing sodium sulfite and sodium bicarbonate in a ratio of 6:1 for 2-4 hr. at 140 and 150°C. and for 1-3 hr. at 155°. The pretreated chips were fiberized to 16 and 35° S.-R., and the mechanical properties of the pulps and their contents of lignin, hemicellulose, rosin and fats were determined. By a 3-hr. pretreatment at 155 and 140° the lignin content decreased to 12.9 and 15%, respectively. Pentosan solubilization was rapid at the beginning of the heating, particularly at 155° and was accompanied by a decrease in pulp yield. The mechanical properties of pulps pretreated for 1 hr. at 155° or 2 hr. at 140° were somewhat higher than those of white groundwood and were considerably improved by prolonging the treatment time to 3 and 4 hr., respectively. They were higher when fiberization was carried out to 35° S.-R. Pulps obtained from mixtures of chips had higher mechanical strength properties than pulps from birchwood chips alone and contained more lignin and less pentosans. Groundwood from chips was also obtained by pretreating birchwood alone and spruce-birchwood mixtures with sodium sulfide and with black liquor. Such pulps were dark in color but had satisfactory mechanical strength properties and were suitable for the manufacture of board and certain types of paper where brightness is not an essential requirement. Black liquor used for chip pretreatment can be subjected to the usual recovery process. Groundwood from chips obtained by the alkaline sulfite process was found suitable for the manufacture of printing and writing papers and of board. Chip pretreatment conditions should be selected according to the type of product to be manufactured.

High-Yield Poplarwood Pulp

Daut, János, Héring, Dezsö, and Kóbor, Lidia. Papíripar 2, no. 5: 175-81 (1958). [In Hungarian; Russian and German summaries] Abstr. Bull. I.P.C. 29:1203.

High-yield (60-63%) pulps approaching the physical properties of spruce sulfite pulp and suitable for parchmentization (greaseproof paper) were obtained by cooking poplarwood or 70:30 poplar-spruce mixtures for 13 hr. at 130°C. with a calcium bisulfite liquor containing 4% sulfur dioxide and 1% calcium oxide. The effects of varying cooking and refining conditions on pulp properties have been studied.

Improving Paper Quality by Hardwood Pulps

Wultsch, Ferdinand, Wochbl. Papierfabrik, 86, no. 23/24: 1019-27 (Dec., 1958). [In German] Abstr. Bull. I.P.C. 29:1193-4.

Systematic studies were made to determine which of six hardwoods, (birch, red beech, alder, poplar, willow and *Ailanthus glandulosa*) would be most suitable for improving the properties of various papers (writing, printing and hygienic or absorbing grades), and which paper properties in particular could be improved by addition of hardwood sulfite pulp to the furnish. The morphological properties and behavior on sulfite digestion of the six hardwoods are reviewed. From the results of this investigation, the following conclusions are drawn. Hardwood additions improve the bulk (beech and aspen more so than birch), absorptivity, tensile strength (optimum with birch), smoothness (aspen and birch more so than beech), filler retention, printability (particularly for gravure), register, opacity, surface strength, suitability for parchmentization (greaseproof papers), and affinity for coating and impregnating agents of papers. At the same time, they reduce the curling and bulging tendency, two-sidedness (with respect to smoothness, surface strength and picking) and difference between tear strengths in the machine and cross-machine direction of papers, as well as wood and hardwood components of the power requirement of the pulp during beating. In general, the soft-mixed stock should be beaten separately.

repeat business . . . **3 MAJOR EXPANSIONS AWARDED TO BROWN & ROOT**

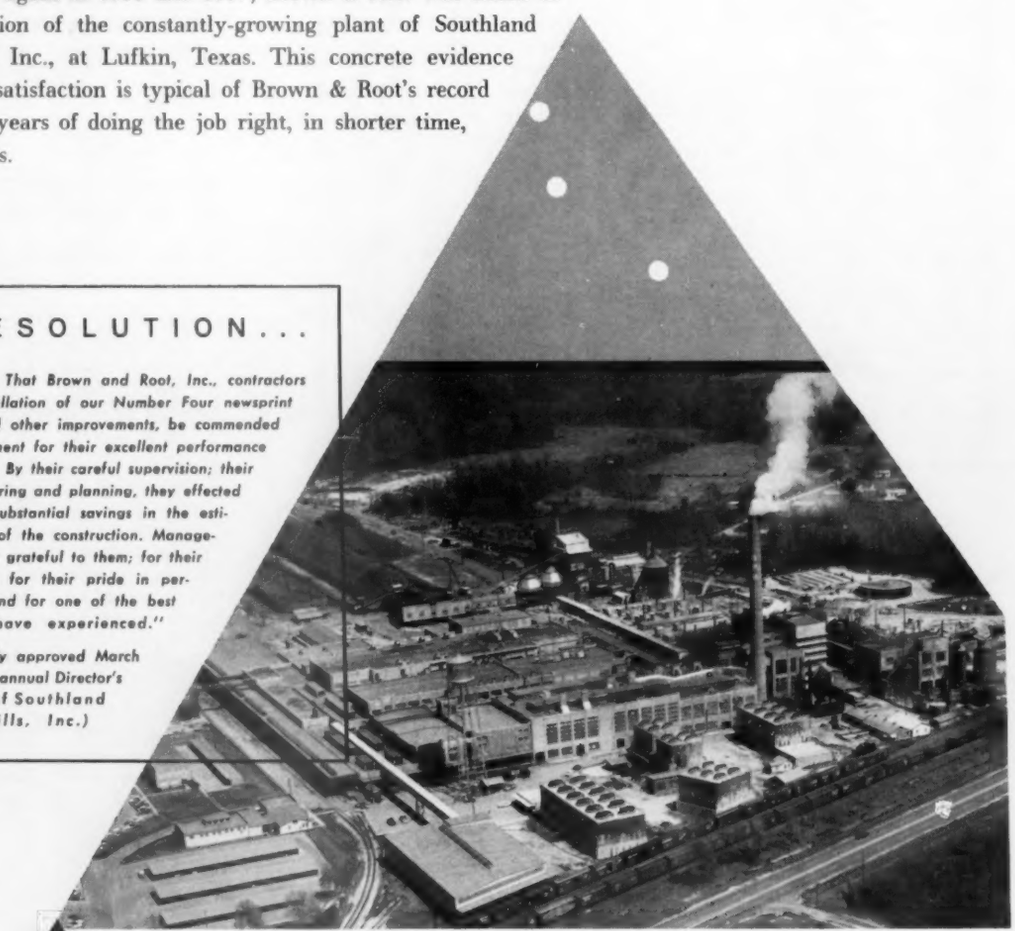
in eleven years

In 1946, and again in 1955 and 1957, Brown & Root was called in for construction of the constantly-growing plant of Southland Paper Mills, Inc., at Lufkin, Texas. This concrete evidence of customer satisfaction is typical of Brown & Root's record through the years of doing the job right, in shorter time, at lower costs.

A RESOLUTION . . .

"RESOLVED, That Brown and Root, Inc., contractors for the installation of our Number Four newsprint machine and other improvements, be commended by Management for their excellent performance rendered us. By their careful supervision; their fine engineering and planning, they effected us a very substantial savings in the estimated cost of the construction. Management is very grateful to them; for their cooperation, for their pride in performance, and for one of the best jobs we have experienced."

(Unanimously approved March 31, 1959 at annual Director's Meeting of Southland Paper Mills, Inc.)



BROWN & ROOT, INC.

Engineers · Constructors POST OFFICE BOX 3, HOUSTON 1, TEXAS

NEW YORK, NEW YORK WASHINGTON, D. C. EDMONTON, ALBERTA MARACAIBO, VENEZUELA

SAO PAULO, BRAZIL CARACAS, VENEZUELA CABLE ADDRESS -- BROWNBILT

What do you see in this quiet picture?

❶ **Is it a "still" ( ) or an action photo? ( )**

❷ **Are the men working?**
Yes ( ) No ( )

❸ **Which is the parent roll?**
Left ( ) or Right ( )

❹ **See any movement? Look closely!**
Yes ( ) No ( )

❺ **Machine-day is 8 hrs ( )**
12 hrs ( ) 24 hrs ( )

❶ The papermaking process doesn't stop for candid photographs. If you checked "action" you're right. The winder has just started a new run. In a few seconds the winding speed will be well over a mile a minute.

❷ That three-man crew is working! Their watchful attitude tells you that the winding operation is completely automatic. Every 8 minutes the crew unloads (automatically) and starts a new 7,000 lb. roll. They're watching the slitter units, web tension, and winder speed, and are ready when necessary to make instant automatic adjustments at the control panels.

TEST YOUR POWERS OF OBSERVATION

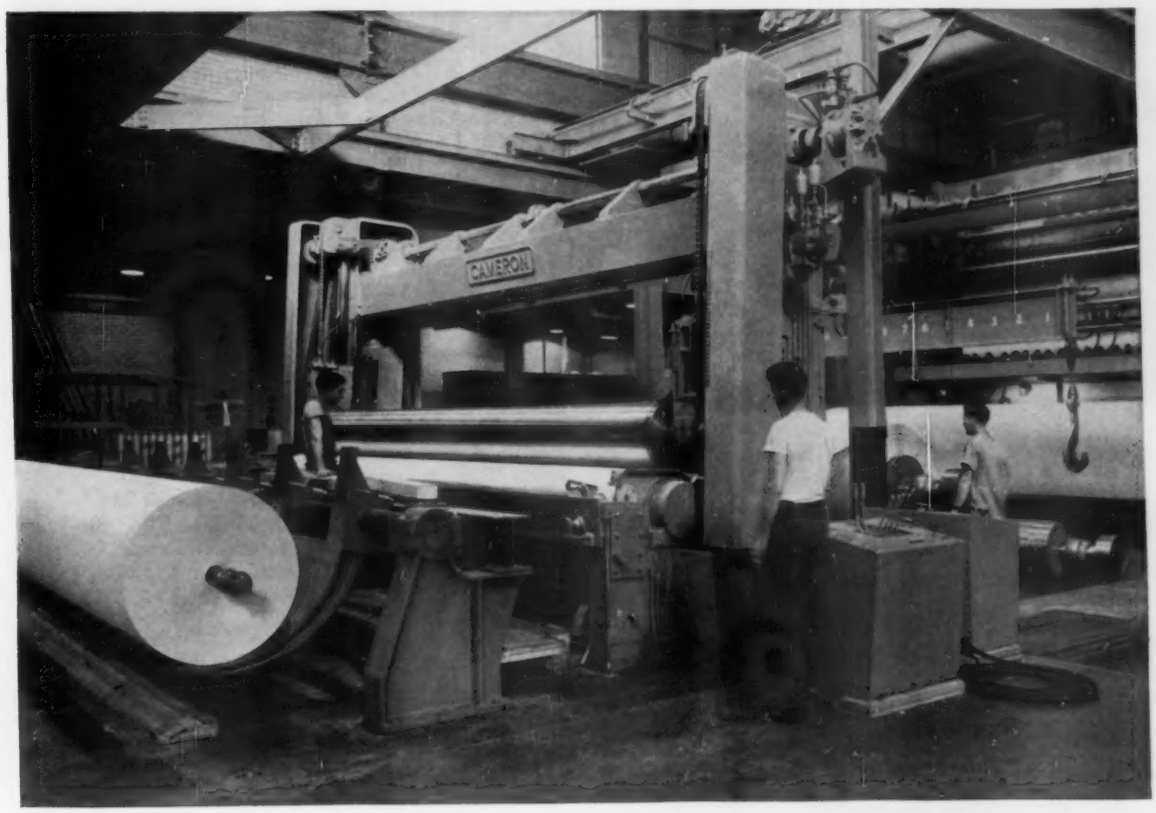
The unretouched candid photograph reproduced below was made at Southland Paper Mills, Lufkin, Texas by a UPI photographer. What you see in it depends on how well you know your winders. Read the questions, then check your answers in the numbered paragraphs.

❸ The parent roll is at the right. You can recognize it by the rough telescoping of its side. The finished roll at the left was unloaded seconds ago. You can tell by the exceptionally smooth, flat side *(unretouched)* that it is a perfect roll, uniformly wound from core to circumference. Cameron Imperial Winders are built to produce perfect rolls every time, automatically.

❹ You probably saw the slight blur as the control operator moved his left hand. The winder is sharp in every detail because there is no vibration. Performance is just as quiet as it looks, even at top speeds with a full payload. The dynamic thrust of almost three tons of paper winding at well over a mile a minute is tamed by the perfect balance, fine engineering, skilled craftsmanship and rugged construction of the winder.

❺ Twenty-four hours is "right" in every busy paper mill. The only change is in the crews. Cameron Imperial Winders are built to stay on the job 24 hours a day at speeds well ahead of the peak requirements of any mill.

THE NAME at the top of the machine tells you it's the fastest winder in the world—the Cameron Imperial—now available with speeds up to 8,000 fpm on newsprint, rewind diameters up to 72", pneumatic score-cut or shear-cut slitting, and automatic controls. If you are interested in fast, low-cost production of better newsprint, paper or paperboard rolls, why not consult with the Cameron Team of Specialists?



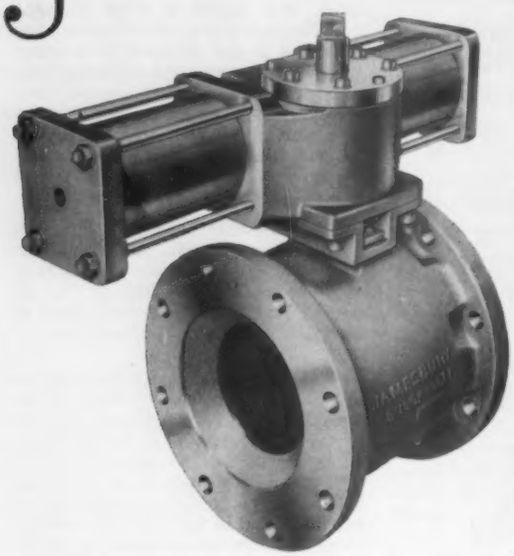
AA-365

Cameron Machine Company, Franklin Road, Dover, N. J.
Canada: Cameron Machine Co. of Canada, Ltd., 15 Hatt St., Dundas, Ontario
France: Batignolles-Chatillon, 5 Rue De Monttessuy, Paris (7e) France

CAMERON
a team of specialists

53 years devoted exclusively to the design and manufacture of slitting, roll winding, unwind and web control equipment.

Jamesbury "Double-Seal"™ Ball Valves



For PULP and PAPER MILLS
EFFICIENCY and ECONOMY
TESTED, PROVEN

Jamesbury, leading designers and developers of the "Double-Seal" ball valve principle, now offer a series of valves for the pulp and paper industry. Exhaustive tests in mill runs have shown the effectiveness of these valves. An example is the Jamesbury Valve used in digester blow service. These valves are ideally designed to handle the after-cooking discharge.

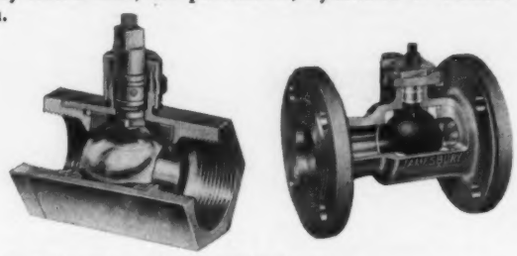
Compare these unique features for *your* valve applications:

ZERO LEAKAGE — "Double-Seal" means seats and seals on *both sides* of the ball, assuring tightest possible closure on both sides of the valve.

HIGH FLOW CAPACITY — with minimum friction loss. Unique valve construction assures utilization of full pipeline capacity.

MINIMUM MAINTENANCE — rugged construction withstands pressure and shock. Needs no lubrication. Compact and lightweight. The self-wiping action of the Ball during rotation prevents residual build-up on sealing surfaces.

REMOTE CONTROLLED — operators available as integral, factory-tested unit, for pneumatic, hydraulic or electric operation.



WIDE RANGE OF MATERIALS — 303 and 316 Stainless Steel, Carbon Steel, Bronze, Aluminum and PVC (Polyvinyl chloride). TEFLON seats and seals — or, if desired, Neoprene or Buna-N. Flanged ALLOY 20, Ductile Iron and Monel valves are available on application.

SIZES — Jamesbury produces Screwed End valves in sizes from ¼" to 3", Flanged valves from ½" to 8" as standard items. 150# and 300# series. 10" valves will be available during the last quarter of 1959. Please request information from Jamesbury Corp. on larger sizes.

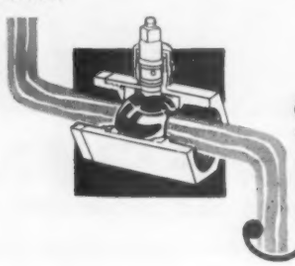
Investigate the Jamesbury Ball Valve concept for these pulp and paper mill applications:

- DIGESTER BLOW VALVES
- WHITE, BLACK AND GREEN LIQUOR LINES
- WATER LINES
- GAS OFF VALVES
- AIR LINES
- ACID LINES
- SAMPLING VALVES
- INSTRUMENT LINES
- BLEACH LIQUOR

Jamesbury "Double-Seal" Ball Valves will help you to:

Prevent Loss of Cooking Liquor
Reduce Blowing Time
Increase Number of Cooks
Assure Trouble Free Processing
Increase Pulp Production
Reduce Down Time

Ask for the new brochure "The Jamesbury Ball Valve In Pulp and Paper Mills." Distributors in Principal Cities.



Jamesbury CORP.

148 NEW STREET, WORCESTER, MASS.

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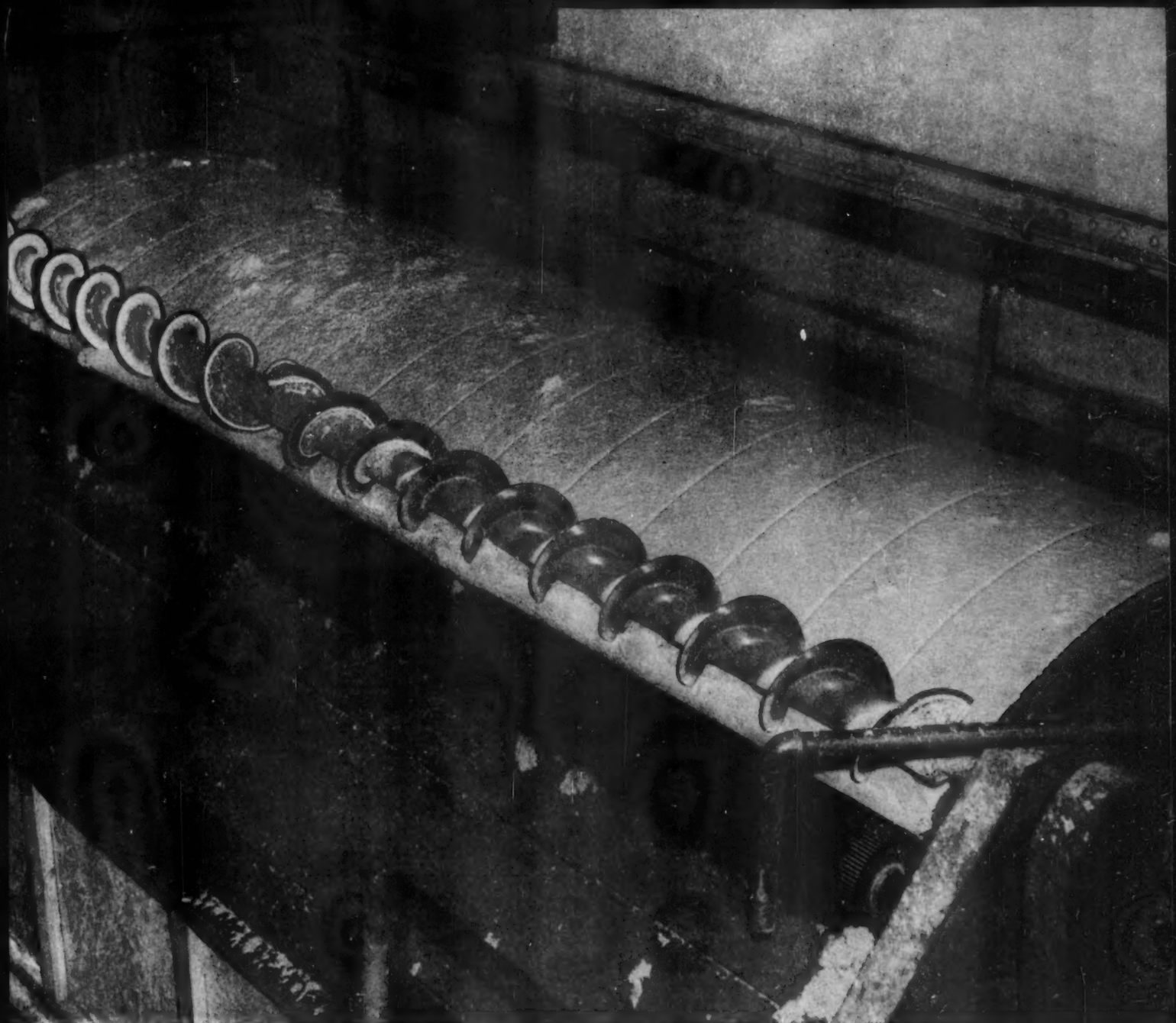


This "Save-All" uses the screw method to reclaim pulp and chemicals from waste water. The screw and the wire cloth on the drum are both Stainless Steel.

"From all indications our Stainless Steel equipment will last the lifetime of our mill"

SAYS MR. J. W. D. HIERLIHY, MILL MANAGER, FRASER PAPER, LIMITED, MADAWASKA, MAINE

United States Steel Corporation—Pittsburgh
American Steel & Wire—Cleveland
National Tube—Pittsburgh
Columbia-Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Supply—Steel Service Centers
United States Steel Export Company

United States Steel

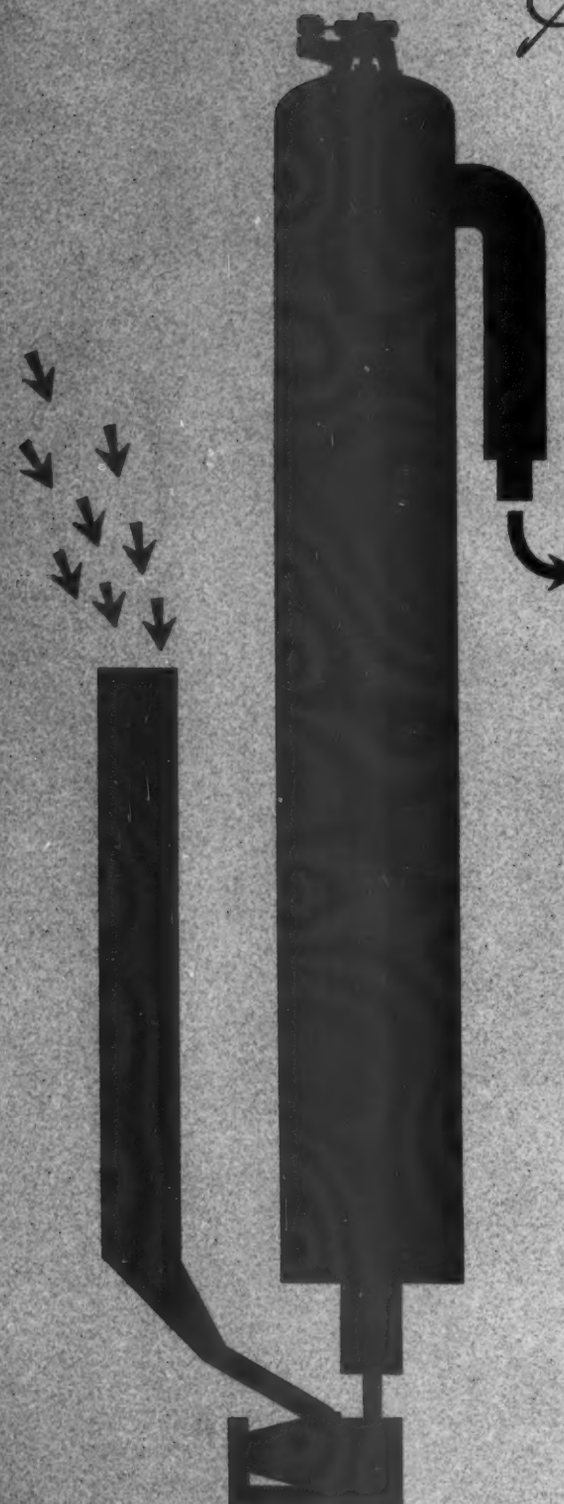
USS

"We've run the gauntlet in trying out various materials for our equipment," says Mr. Hierlihy. "It was a bright day when we first installed Stainless Steel. Stainless resists corrosion from chemicals used in papermaking. We haven't lost one bit of Stainless Steel pipe to corrosion. From all indications, this Stainless Steel will last the life of the mill itself.

"Our pipes and tanks retain a smooth, dense surface. Dirt and residue do not stick to it—a quick rinse keeps all our equipment clean as a whistle. As a result, we save on maintenance and we produce clean, high quality paper."

Build and repair with Stainless Steel in your plant. USS Stainless Steel is available through your U. S. Steel representative or your local Steel Service Center.

USS is a registered trademark



Announcing

THE NEW IMPCO CONTINUOUS DIGESTER

Designed for Pulping:

KRAFT

NEUTRAL SULFITE

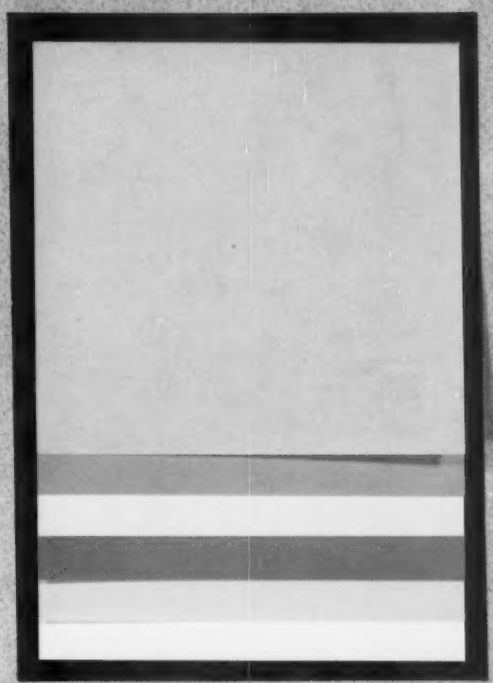
SULFITE

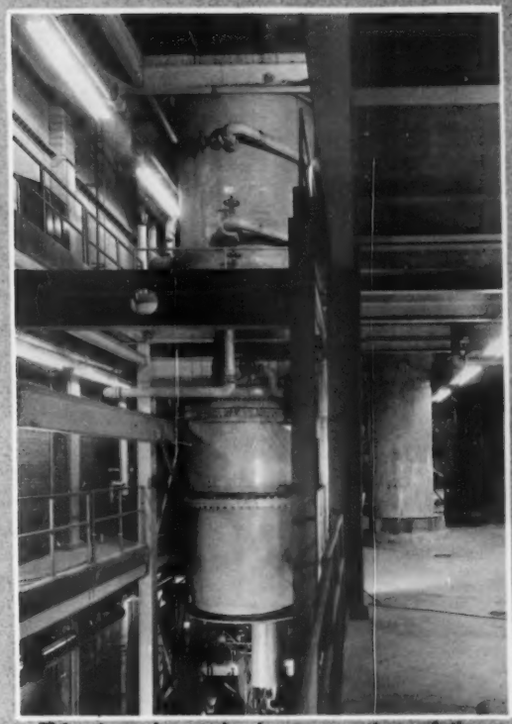
SODA

SPECIAL PROCESSES

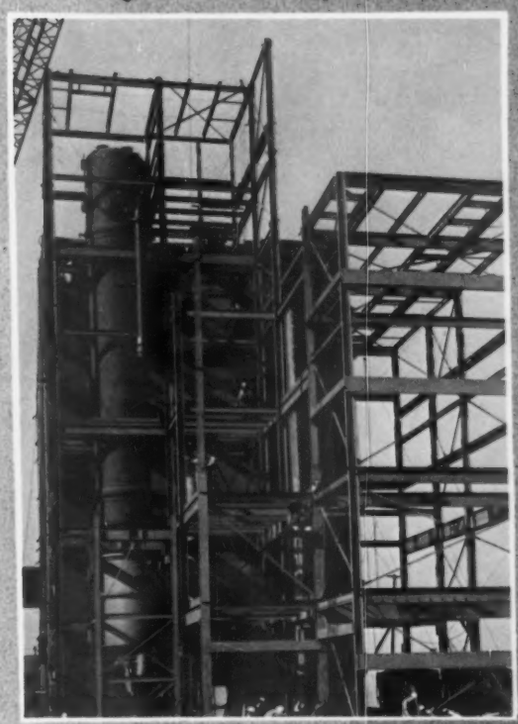
Long or Short Cycle, High or Low Pressure

These are a few of the fine colors of Hammermill bond which now contain Neutracel® pulp produced in the Impco Continuous Digester





This view shows the lower portion of the Digester and the Chip Lifter.



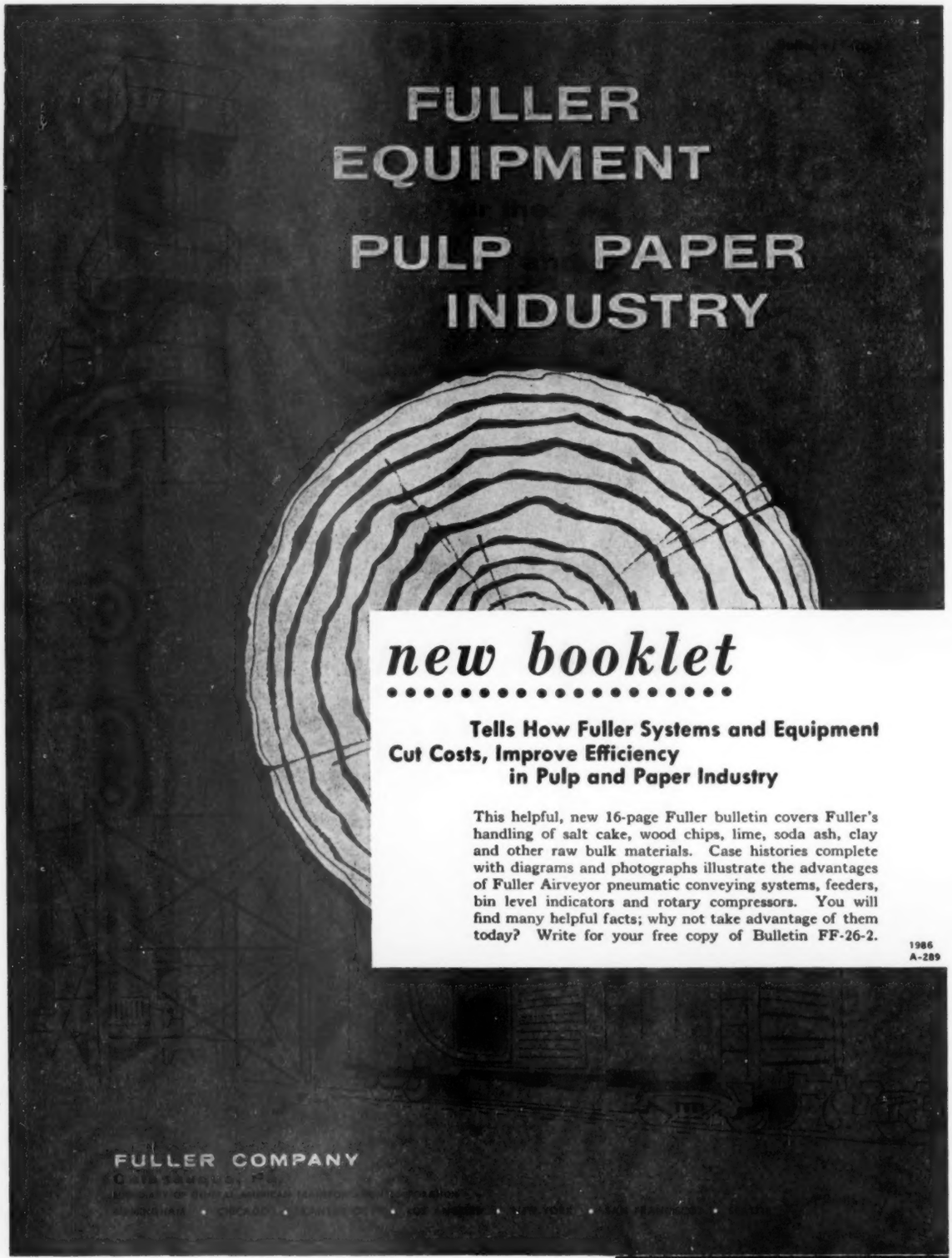
First commercial Impco unit being installed at Hammermill Paper Company, Erie, Pennsylvania.

IMPROVED
MACHINERY INC.

IMPCO®

NASHUA, NEW HAMPSHIRE

IN CANADA:
Sherbrooke Machineries Limited
Sherbrooke, Quebec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EQUIPMENT
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PULP PAPER
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new booklet
Tells How Fuller Systems and Equipment
Cut Costs, Improve Efficiency
in Pulp and Paper Industry
This helpful, new 16-page Fuller bulletin covers Fuller's handling of salt cake, wood chips, lime, soda ash, clay and other raw bulk materials. Case histories complete with diagrams and photographs illustrate the advantages of Fuller Airveyor pneumatic conveying systems, feeders, bin level indicators and rotary compressors. You will find many helpful facts; why not take advantage of them today? Write for your free copy of Bulletin FF-26-2.
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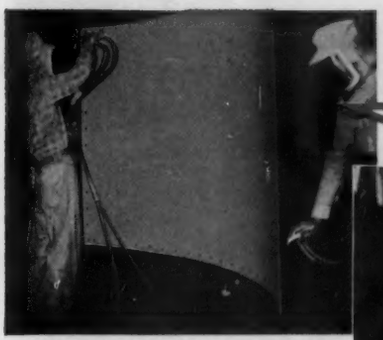
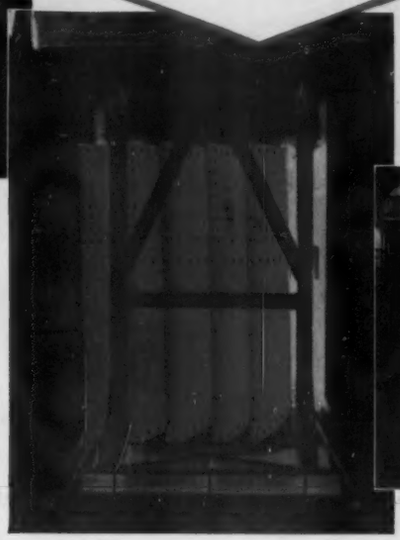
Fuller
....pioneers in harnessing AIR

this wedding of glass to steel...

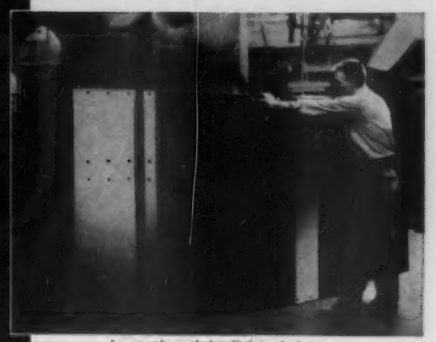


Spraying liquid glass slip on grit-blasted sheets.

Microphoto shows how glass permanently fuses to steel. (Magnification: 150 diameters.)



Glass is fused to the steel at temperatures in excess of 1,600° F.



Inspection of the finished sheet.

. . . guards your bulk materials with permanence of steel—purity of glass*

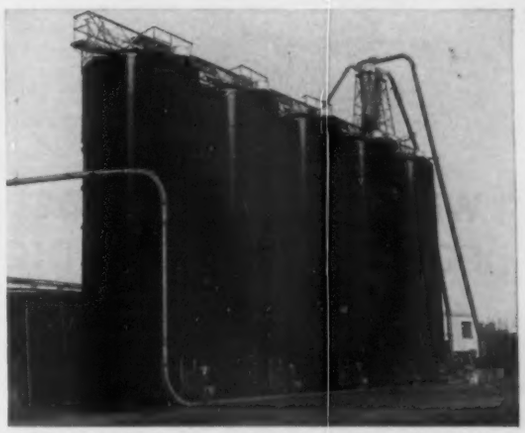
The permanent bonding of glass fused-to-steel *inside* and *out* —exclusive with Permaglas MECHANIZED STORAGE UNITS!

Think of it! A clean, gleaming coat of glass . . . permanently bonded to steel at temperatures in excess of 1,600° F., with bond strength up to 20,000 psi. This impervious glass has the same coefficient of expansion as steel itself . . . withstands weathering and abrading of bulk materials.

This *exclusive* feature of *Permaglas* Mechanized Storage Units makes possible sanitary, easy-to-clean bulk materials handling systems. Eliminates ravages of corrosion . . . deterioration of stored materials. Virtually ends maintenance costs! Another *exclusive* feature: Sweep-arm bottom unloaders completely mechanize bulk materials handling . . . cut labor costs as much as 67%.

Mail coupon today for full details on this new cost-saving way to process and store bulk materials.

*HYDRASTEEL—Process covered by U.S. Patent No. 2,754,222



Exclusive mechanical sweep-arm bottom unloaders, automatically discharge bulk materials into the conveying system in the Permaglas Storage Unit System shown above. Incoming bulk materials are top-loaded directly into the Permaglas Units.

Through research ...a better way

A.O.Smith

CORPORATION

HARVESTORE PRODUCTS

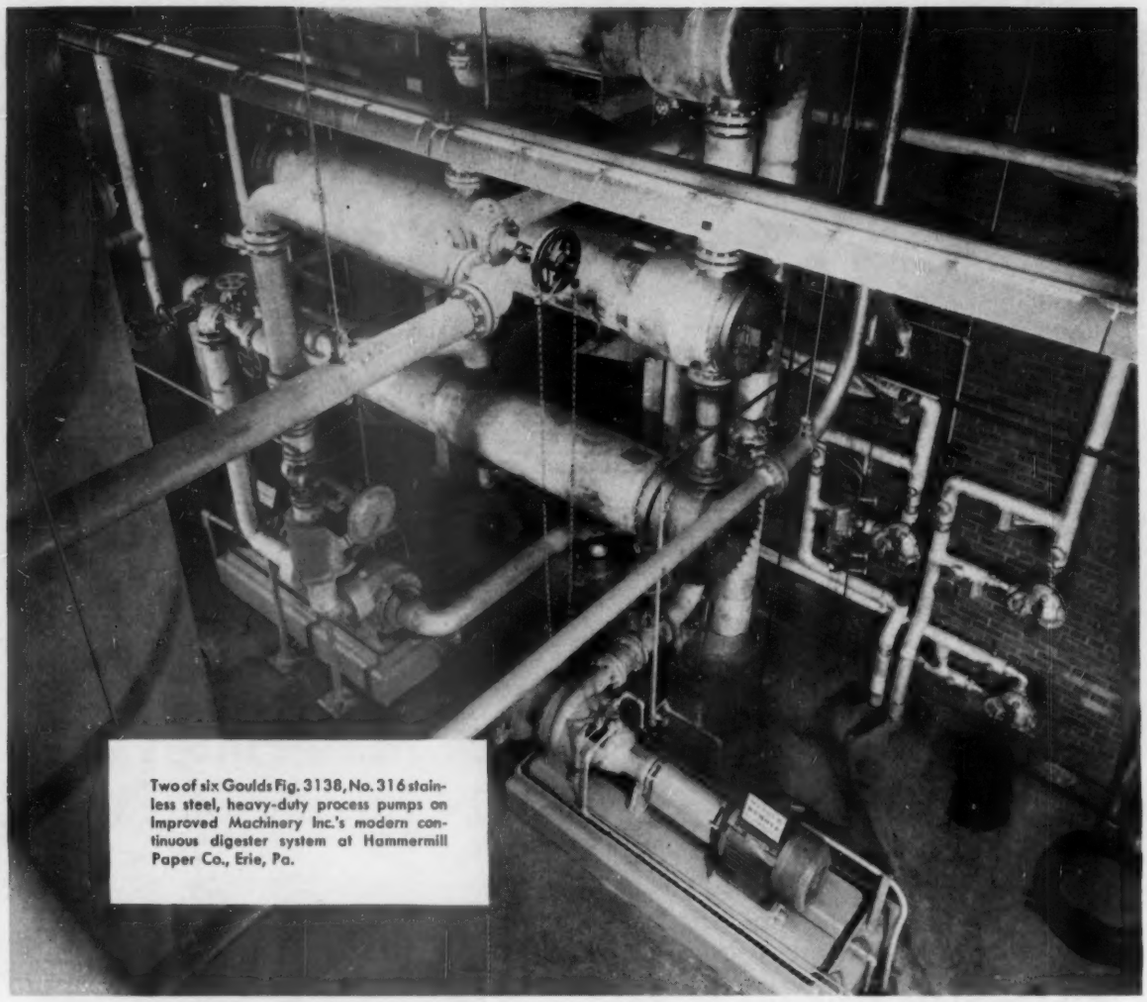
KANKAKEE, ILLINOIS

A. O. Smith International S.A., Milwaukee 1, Wis.

A. O. SMITH CORPORATION, Dept. PP-99
Kankakee, Illinois

Please have Permaglas System Planning Service Representative call for appointment. Send me free Permaglas Mechanized Storage Unit Bulletin MU-100.

Name.....
Title.....
Company.....
Address.....
City.....Zone...State.....



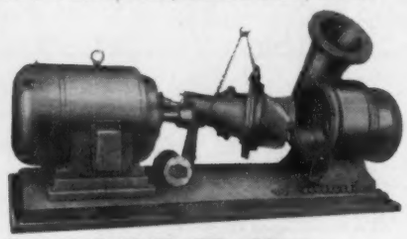
Two of six Goulds Fig. 3138, No. 316 stainless steel, heavy-duty process pumps on Improved Machinery Inc.'s modern continuous digester system at Hammermill Paper Co., Erie, Pa.

WHAT KIND OF PROCESS PUMP FOR CONTINUOUS DIGESTER SERVICE?

"Continuous digester"—the most outstanding development in paper and pulp processing of recent years—is a tough pumping service. The liquids handled are hot, corrosive and many times abrasive. Reliable pump performance is an absolute *must*. Any wonder then that HAMMERMILL chose Goulds heavy-duty process pumps for this service at the new Erie, Pa., mill where the IMPCO continuous digester process is a most important feature. Look at the advantages:

1. Extra-thick casings—with generous corrosion allowances—withstand high temperatures, and corrosion and abrasive effects.
2. Water-cooled bearings on every size for longer bearing life when handling hot liquids.
3. Fully open impeller with ejector vanes on back side is adjustable externally to compensate for wear.
4. Back pull-out design with spacer coupling permits easy dismantling without disturbing piping or driver.
5. In and out stuffing box flushing connections are standard construction for maximum packing life.

For further information on Goulds heavy-duty process pumps for continuous digester service, contact your nearest Goulds representative or write Dept. PP-99.
GOULDS PUMPS, Inc., Seneca Falls, N. Y.



GOULDS GP PUMPS

SHOWCASE FOR QUALITY

Producing pulp of uniform brightness, strength and purity is not left to chance at Weyerhaeuser's new Grays Harbor Mill.

Controls are maintained at every processing stage which automatically measure and record temperatures, pressures, chemical proportioning and other vital functions.

And, even as these quality checks set high standards today, Weyerhaeuser research at Grays Harbor and its other mills is leading to new and better processes and products for tomorrow.

At the filter plant, chemical proportioning and filter cleaning are automatically controlled. Water color, turbidity and other quality factors are checked many times daily.

Each cook in each digester is automatically plotted on charts, dials and flashing lights in the constantly manned digester control room.

'Round the clock tests are run on each pulp batch in the main plant laboratory by chemists whose job is to ensure high-quality pulp.

Moisture content and a series of other quality test checks are made every few minutes on pulp as it comes off the drying machine.

Chart room contains process records on all pulp produced.

The DRYER FELT
they are all talking about—

The SCAPA
Synthetic Reinforced Cotton Dryer Felt
has been granted
U. S. Patent No. 2,882,933

Types 1166-S, 1164-S, 1464-S
2070-S and 2064-S are
Drying **more** paper **better**
every day

SCAPA known throughout the world wherever paper is made

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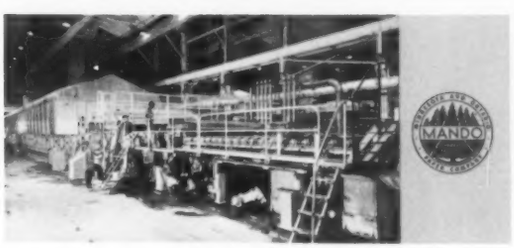
Sole U. S. Agents for

SCAPA DRYERS, INC.
WAYCROSS, GEORGIA

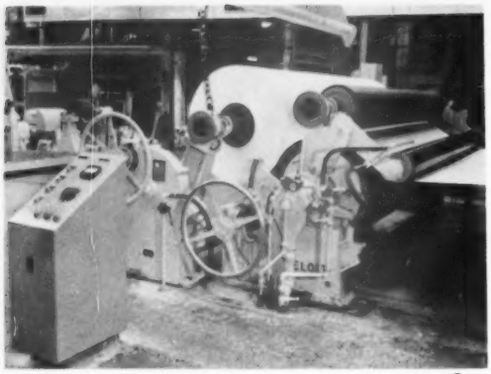
S. R. CHRISTENSEN

Minnesota & Ontario Paper Company Number 2 Machine, International Falls, Minnesota

Minnesota & Ontario Paper Company



MANDO'S new 158″ publication grade machine marks the completion of an extensive modernization program at International Falls. For details of this versatile, new machine, especially designed for a wide range of publication grades, please turn the page.



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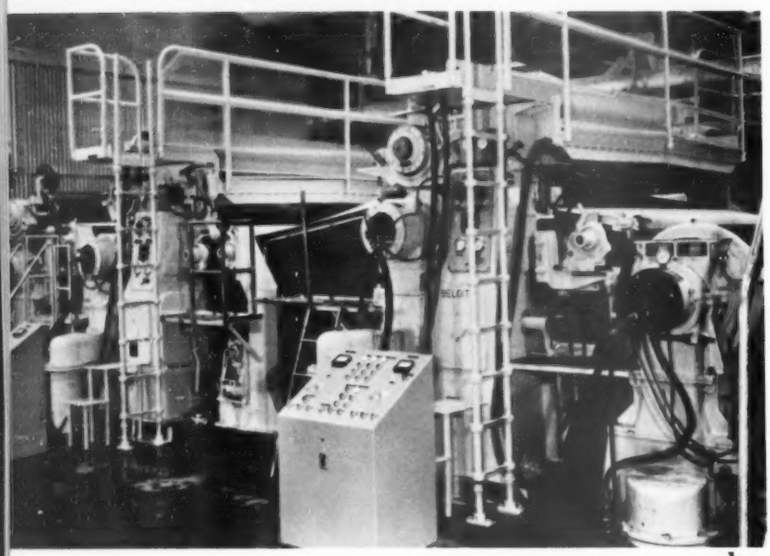

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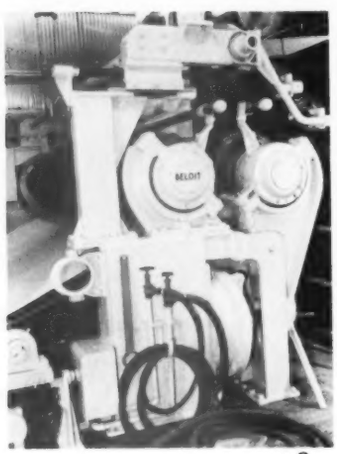

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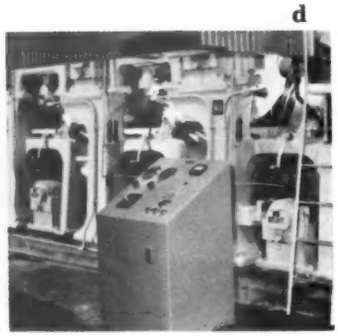
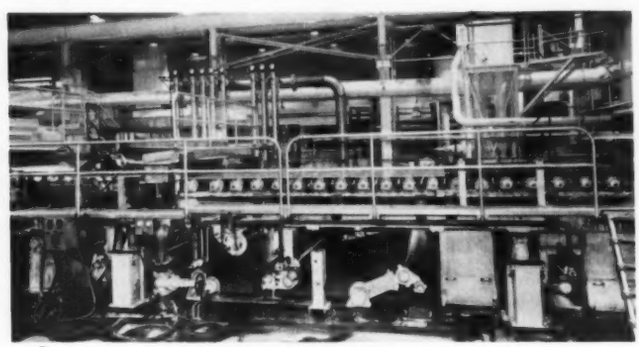


d

. . . some features of Mando's new Beloit 158″ publication grade machine pictured on the preceding page

The start-up of the new No. 2, 158″ Beloit machine now brings MANDO'S production at International Falls to 270 tons per day. This versatile machine, for publication grades, is designed for operating speeds in the 1500 fpm range. Pictured on this page are some of the machine's features: (**a**) transfer type reel; (**b**) straight-through suction presses, suction couch, and plain smoothing press; (**c**) Beloit horizontal size press—located between second and third dryer sections; (**d**) dryer section—enclosed gear-type drive, antifriction bearings serviced by Beloit roll filter lubrication; (**e**) 158″ Beloit removable, shakable Fourdrinier; (**f**) oscillating unwind stand and water-cooled brake.



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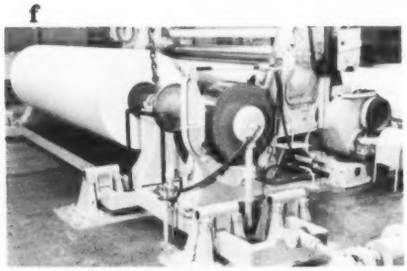


BELOIT IRON WORKS PAPER MACHINERY BELOIT, WIS., U.S.A.

BELOIT

PAPER MACHINERY

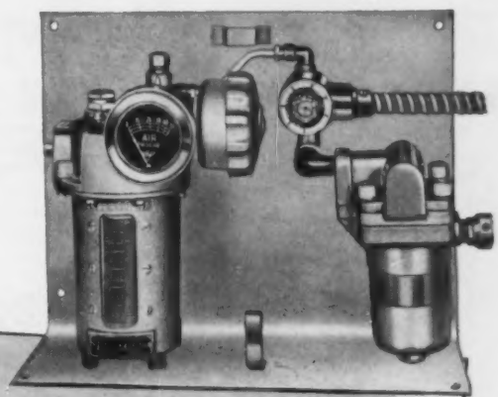
your partner in papermaking

How to choose a

LUBRICATION SYSTEM

that provides constant, uniform lubrication

at savings of up to **90%**



use this handy check list:

Will your lubrication system be fully automatic? Oil-Mist starts and stops at the touch of your machine switch.

Will the system that you choose cut oil consumption by 90%? With the Alemite Oil-Mist System you can get better bearing lubrication with only 1/10th as much oil as required by other methods.

Will your lubrication system reduce bearing temperatures? The answer is "yes," if it's an Alemite Oil-Mist System. Reduction in fluid oil friction—plus air flow through bearing—greatly cuts bearing heat.

Will your system extend bearing life? You can definitely count on it, if you choose Oil-Mist. Oil-Mist has extended the service life of many bearings, even under adverse operating conditions, from 10 to 12 times!

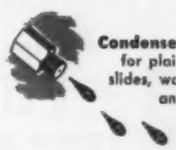
Will you have a continuous system? Oil-Mist constantly feeds a uniform volume of fresh oil to each bearing. No oiling schedules. No feast-or-famine lubrication.

Does it protect against contamination? Satisfied Oil-Mist users say yes. A constant flow of clean, air-oil mixture—Oil-Mist—through bearings keeps out dirt and abrasives. Oil-Mist also eliminates wasteful oil handling and applying.

Lubricates any bearing on any machine in One Of Three Ways:

Oil-Mist for high speed anti-friction type of bearings.

Oil Spray for low speed anti-friction and open and enclosed gears and chains.



Condensed Oil for plain bearings, slides, ways, vees, cams, and rollers.

MAIL COUPON for Oil-Mist demonstration and information

Symbol of SW Excellence

ALEMITE DIVISION **STEWART-WARNER** CORPORATION

Alemite, Division of Stewart-Warner, Dept. QQ-99
1850 Diversey Parkway, Chicago 14, Illinois

☐ Please send me a free copy of your Oil-Mist catalog.

☐ Please have your Alemite Lubrication Representative arrange a no-obligation demonstration.

Name .....

Company .....

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City ..... Zone ..... State .....

Get out the dirt... *she doesn't see!*

D-I LESTOIL LIQUID DETERGENT

No matter what grade of raw stock you use... no matter what care you take in sorting... there's always the danger that grease, oil, wax and other contaminants will get by — to create specs or shiners or otherwise blemish your finished sheet.

Today... increasing numbers of smart mill operators insure against these costly headaches by adding D-I LESTOIL when cooking rags.

D-I LESTOIL speeds up wet-out, assures uniform packing and cooking in the boiler; thoroughly penetrates every fiber. It emulsifies and disperses grease, graphite, wax... all dirt. Produces fibers free of soil, fibers that bleach readily and absorb dye uniformly.

D-I LESTOIL guards against redeposition of soil ... permits complete, free rinsing.

End result? Clean, bright sheets of uniform color and quality.

FREE!

A generous sample and complete details on how to get better quality paper with d-i LESTOIL!

MAIL THIS COUPON TODAY!

LESTOIL, INC.
A subsidiary of Adell Chemical Co.

LESTOIL, INC. 129 Garfield St.
HOLYOKE, MASS.

Please send me a free sample of d-i LESTOIL and complete directions for use.

NAME _____ **TITLE** _____

FIRM _____

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One man...

your Allis-Chalmers man... can supply and coordinate all this equipment—and more

Pumps, motors, drives, processing machinery, electrical equipment, water conditioning equipment, materials handling equipment — Allis-Chalmers builds them all. Much of it is specifically designed for pulp and paper service. All of it is designed to work together. And you get more, much more, than the finest equipment when you specify Allis-Chalmers. The obvious time- and money-saving advantages of single-source buying, and a host of services ranging from preliminary planning to continuous field service, are all yours.

Whether you are contemplating major modernization or the profitable addition of a single machine, the man to call is your A-C representative. His recommendations are backed by the many Allis-Chalmers engineering departments, by complete research and testing facilities, by experience gained in a close working relationship with the pulp and paper industry. *For complete information, contact your nearby A-C sales office or write Allis-Chalmers, Milwaukee 1, Wisconsin.*

ALLIS-CHALMERS A-C

A-5975-PP

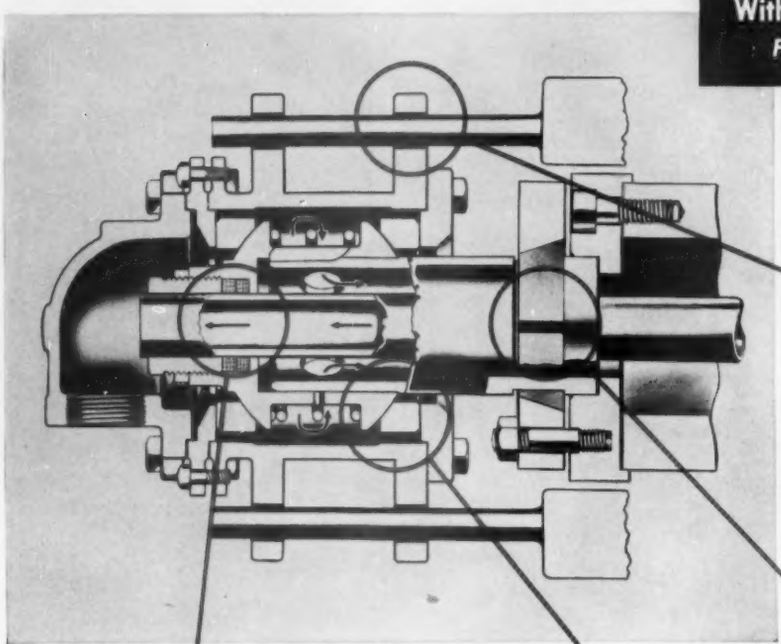
This SUPER Joint goes on faster, stays on longer

...for high speed paper machines with rotating syphon pipes

Type L-N Johnson Joint

With "Quick Release" Nipple

First in the Paper Industry



FLOATING ACTION

Simple rod supports carry all the weight of the body and connections —permit the rotating assembly to "float" freely inside. Can be adapted for machines with open or enclosed gearing.

EASY ON . . . AND OFF

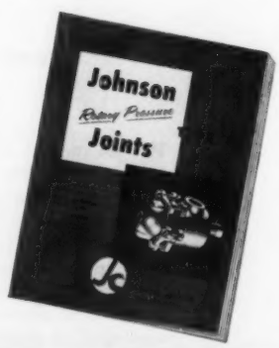
Johnson "Quick Release" Nipple utilizes powerful wedging action to lock nipple securely to journal. You install the joint—or remove it for inspection—with just an end wrench; no danger of damaging nipple with heavy pipe wrenches.

BEST DESIGN YET

Rotating syphon pipe does not rotate in the packing; thrust collar, nipple, packing gland and syphon pipe all rotate together as a unit. Joint needs no lubrication or adjustment. Time-proved construction has only a few simple parts—a design which thwarts trouble, permits easier field servicing. Assembly plate provides ready access to syphon pipe.

SUPER CONSTRUCTION . . . AND STAMINA

Teams "Green Streak" seal rings, of much harder and denser structure, with Ni-Chrome plating on wearing surfaces. Results: Considerable reduction in friction load and much longer service life.



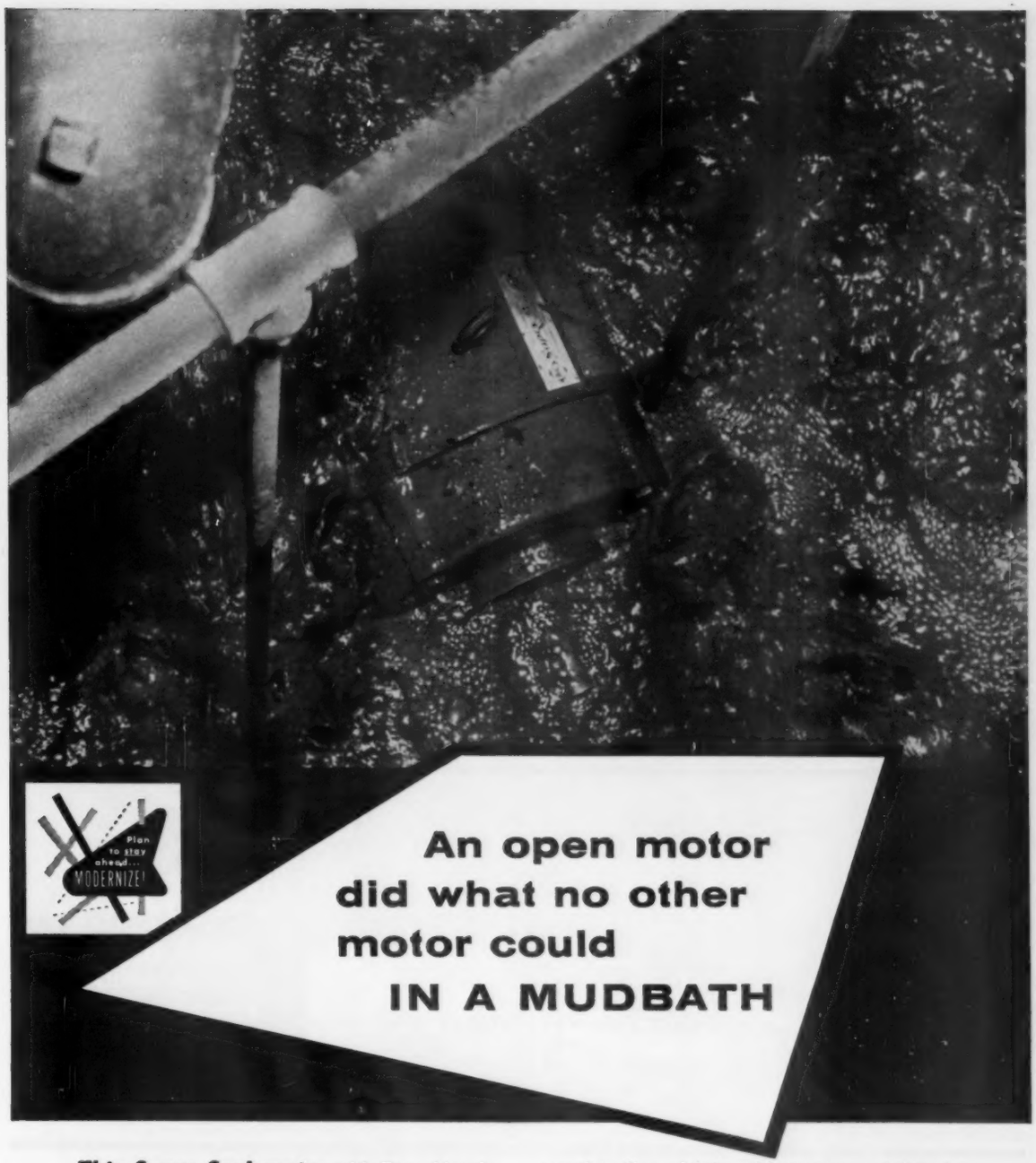
Try it in your own mill. We'll gladly furnish a pair of Johnson Joints for 90 days without obligation. Johnson Joints come in sizes and types for all needs.

For full information on Type L-N ask for Bulletin N.

THE JOHNSON CORPORATION

849 WOOD STREET • THREE RIVERS, MICHIGAN

Rotary Pressure Joints • Direct Operated Solenoid Valves



This Super-Seal motor with *Poxeal* insulation and protected bearing was not fouled by mud. An Allis-Chalmers customer, in a frequently flooded area, required a motor that could readily start even after prolonged immersion in mud.

The "dirtiest mud available" was used in conducting the successful tests in the A-C Motor Laboratories.

Motor user requirements like this form the basis for A-C pioneer-leadership in motor development. Motor buyer needs created the most complete line of integral-horsepower motors in industry. Induction, dc, wound-rotor, synchronous, gear, tube-type and *Synduction* motors, and now *Super-Seal* motors! And, if these lines don't fill your need, A-C engineering excels in special design.

Motor users in the pulp and paper industry can benefit from this pioneer-leadership. Contact your A-C representative or distributor, or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.

Super-Seal, Poxeal, and Synduction are Allis-Chalmers trademarks.

A-C ALLIS-CHALMERS

A-1005-PP

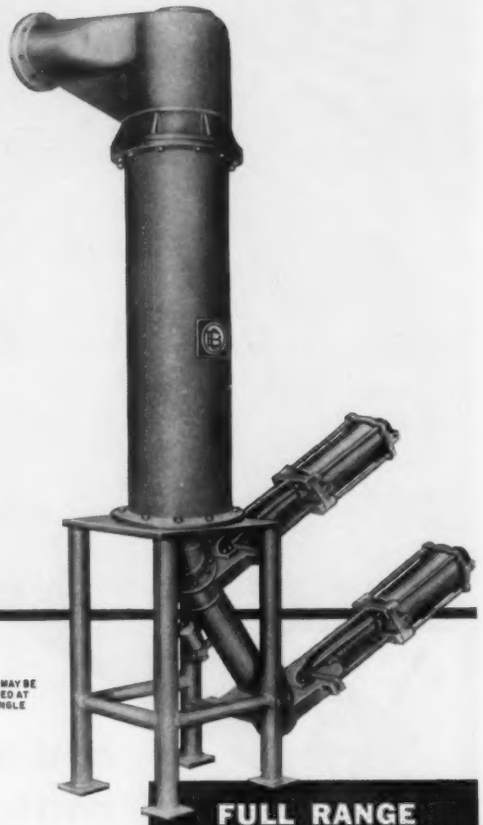
Just 1 Black-Clawson LIQUID CYCLONE Cleans 50 Tons of Filler Stock Per Day in 7 sq. ft. of Floor Space

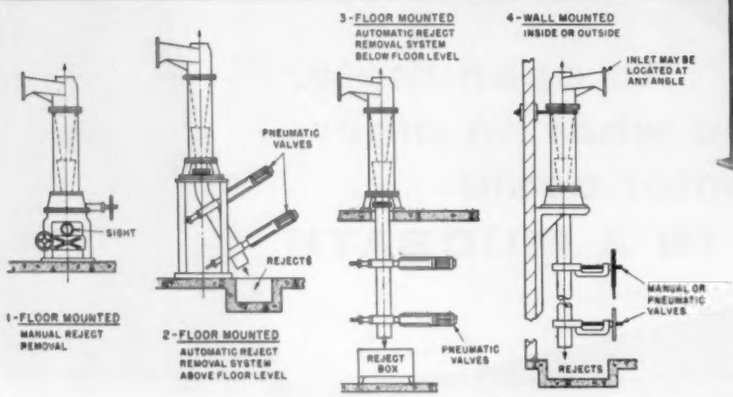
New Ceramic Liner Assures Longer Life

This new free vortex type high velocity separator removes dirt, grit and other rejects from slushed paper stock without plugging. It has been proved highly efficient as a primary cleaner following the Hydrapulper, ahead of machine screens on Fourdrinier and cylinder machines or on cylinder vats where screens aren't used.

- Non-plugging features assure continuous operation.
- Extra long life with new, exclusive "Cyram" (special ceramic) liners.
- Compact, saves space, needs no supporting members.
- Manual or automatic reject system.
- Both low and high pressure units available.

Additional specifications and operating data are available at our Shartle Division. May we send it to you?





FULL RANGE
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FOR ANY TONNAGE
REQUIREMENTS

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THE BLACK-CLAWSON COMPANY

SHARTLE DIVISION, MIDDLETOWN, OHIO

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PANEL NO 1
TRANSFER PA
TYPICAL of A-C pump contributions is the ACAP pump for fan, proportioning or head-box supply duty. It features easily adjustable discharge and head to handle variations in process flow.
Plan to stay ahead... MODERNIZE!

From this cubicle comes advance

proof of pump performance

This master control room of Allis-Chalmers pump test floor is far removed from paper mills. Yet, engineers working here know exactly what your needs are — and which Allis-Chalmers pump will best do the job.

Suction heads, *discharge heads, gpm capacity, required horsepower* plus other essentials for satisfactory pumping performance are all proven in advance.

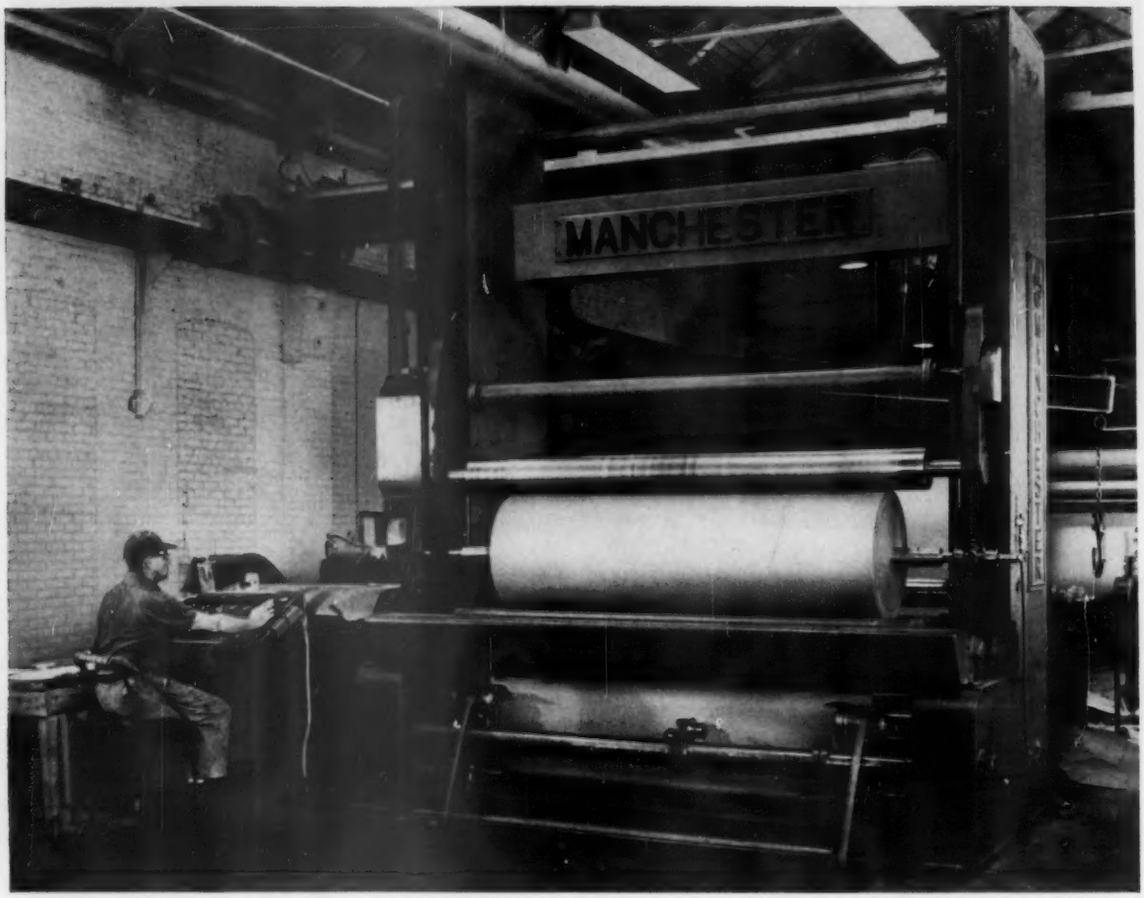
Performance testing like this is only one reason why A-C is recognized as a full-line leader in meeting the pump needs of pulp and paper. "Teamed" motors and control; customized standardization of parts and materials; engineering assistance and nationwide service are others.

Whatever your requirements in centrifugal pumps — from the smallest to 45,000-gpm giants — contact your A-C representative or distributor. *Or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.*

ACAP is an Allis-Chalmers trademark.

A-5981-PP

ALLIS-CHALMERS



Here's another profit-making installation
by MANCHESTER MACHINE COMPANY

Smooth, tight rolls every time—low maintenance—trouble-free operation—these are the things that add to paper mill profits. Pictured above is a Manchester winder in operation at a well-known Michigan mill. This was a *repeat order* placed less than six months after installation of their first Manchester winder.

Designed to accommodate 84-inch diameter rolls, this rugged all-steel machine room winder is turning in profit-making performance day after day.

See what Manchester can do for you before you order another winder. THE MANCHESTER MACHINE COMPANY, MIDDLETOWN, OHIO.

MMC

Manchester Builds Profits for Papermakers

NOW

for efficient vacuum service as low as 30 CFM...

This 30 CFM unit is the smallest of the new line of 18 Roots vacuum blowers ranging up to 1,000 CFM. They bring the total selection of Roots blowers to 54 sizes...with savings for you in every size.

A BIG SELECTION OF SMALL ROOTS VACUUM BLOWERS

Roots-Connersville adds 18 small-volume vacuum pumps to its already extensive line to give you better selection, better performance in limited-volume applications. This new line is designed to handle capacities ranging from 30 CFM to 1,000 CFM, for operation at up to 20 inches mercury vacuum in single stage construction. These units are designed for compounding for higher vacuum service.

Major features of the larger Roots water-sealed units are retained: simple, efficient design without internal valves, no internal contact between moving parts, normal maintenance limited to oil changes, efficient operating speeds and minimum sealing water requirements. The result is more CFM per dollar.

Only Roots-Connersville offers exclusive rotary positive design and such ease of installation in vacuum blowers of this size. They are now available for a wide variety of application in the food, chemical, petroleum, paper, sewage and industrial waste treatment, mining and other industries.

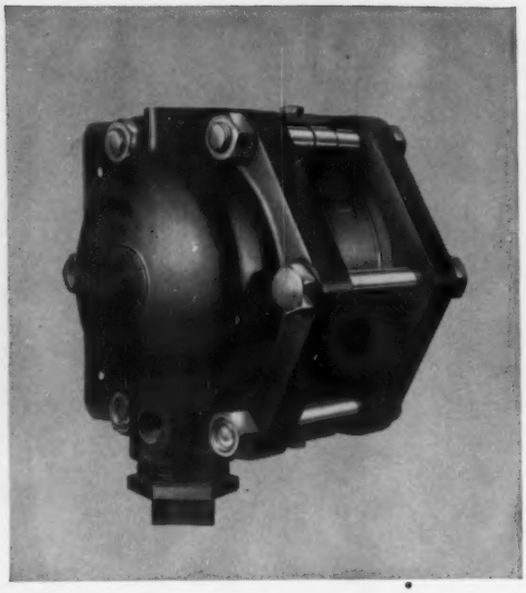
Your nearest Roots-Connersville sales engineer has full details on this new series of vacuum blowers. Or write for a specification sheet and for Bulletin VP-158 covering the larger units.

ROOTS-CONNERSVILLE BLOWER

DIVISION OF DRESSER INDUSTRIES, INC.

959 Willow St., Connersville, Indiana. In Canada—629 Adelaide St., W., Toronto

NEW!



Honeywell Bellows Meter . . .

unequalled for accuracy, stability, versatility in flow and liquid level metering

The new Honeywell Bellows Flow Meter gives the better performance demanded by its potential users. It's the most advanced meter body available today, with important advantages never before found in flow and liquid level meters.

Some of its outstanding features:

Sensitive and accurate—Sensitive to within 0.05% of full scale . . . calibrated accuracy ±0.5% of full scale.

Leakproof—Between liquid fill and process fluid.

Automatically stabilized—Changes in meter body temperature or static pressure have no effect on output shaft position. The Honeywell Bellows Meter operates efficiently in surrounding temperatures of minus 40°F to plus 250°F.

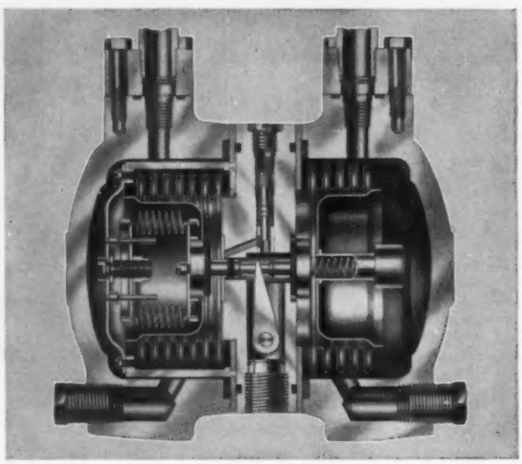
Unmatched convenience features—Including fast range changing in the field . . . connections for both horizontal and vertical piping . . . quick calibration and adjustment . . . easy cleaning and servicing.

High corrosion resistance—Seamless, stainless steel formed bellows give long, trouble-free service with virtually all process fluids.

Fast, effective damping adjustment—New type pulsation check with rectangular orifice enables essentially linear damping adjustment . . . and you can adjust from outside the meter body during operation.

Models are available in many ranges, for both flow and liquid level measurement and control. Get details on *all* the features of the new Honeywell Bellows Meter by calling your nearby Honeywell field engineer today . . . he's as near as your phone.

MINNEAPOLIS-HONEYWELL, Wayne and Windrim Avenues, Philadelphia 44, Pa.



REFERENCE DATA: Catalog C22-1

Honeywell

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liquid or dry

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Wisconsin Rapids, Wis.

the shortest distance between two points is usually the distance between our plant and you!

Check the list of General Chemical's dry or liquid alum producing locations at left. Chances are one is convenient and close to you. In addition to these plants, our chain of warehouses across the country makes stocks of dry aluminum sulfate readily available in every major center of commerce. Write or phone for information on how we can serve you.

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Basic Chemicals for American Industry

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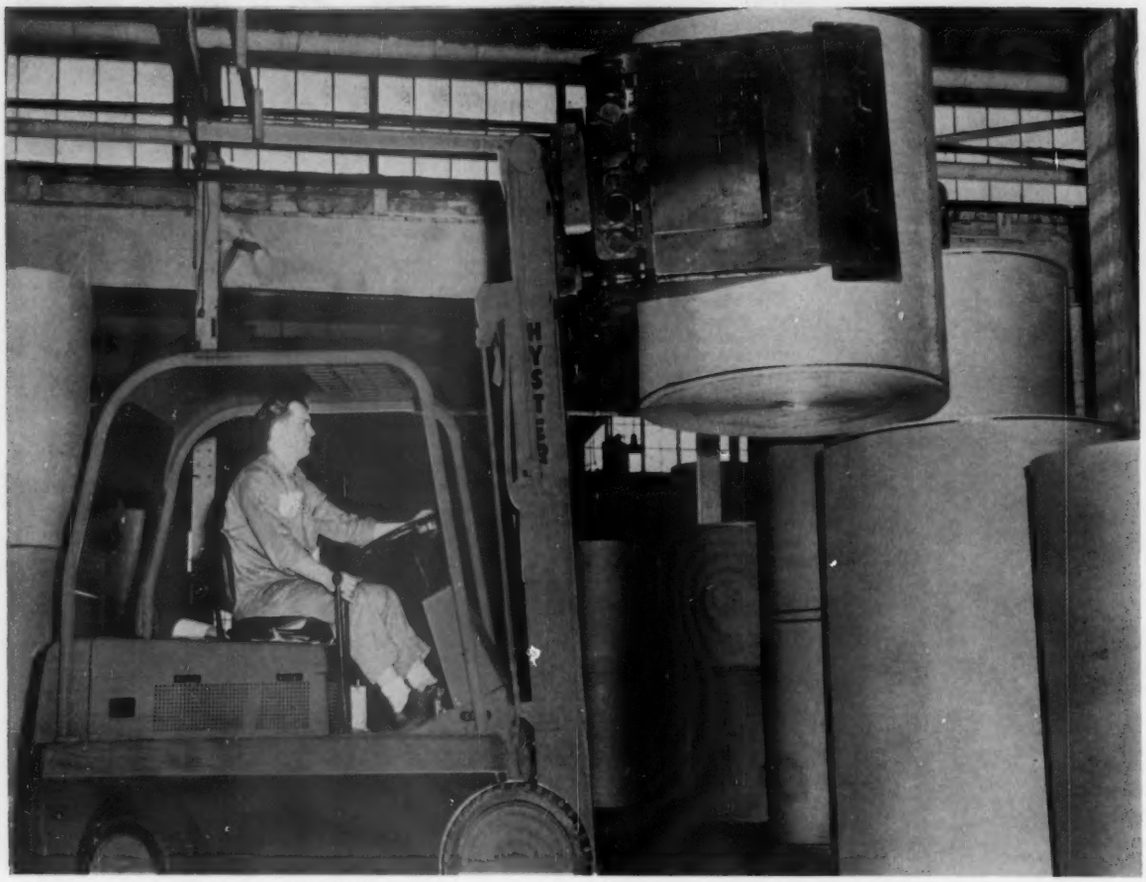

How Hyster Trucks cut paper handling costs

Highly maneuverable Hyster SpaceSaver trucks handle heavy paper rolls at a profit-making pace because they have the fastest lift speed, shortest turning radius, and most effortless control system of any trucks in the 3,000 to 10,000 lb. class. Compare these Hyster advantages:

- **POWER for handling capacity loads fast.**
- **HYSTAMATIC POWER SHIFT TRANSMISSION.**
- **MONOTROL CONTROL SYSTEM (on 3,000, 4,000 and 5,000 lb. Models).**
- **POWER STEERING—shortest turning radius.**
- **Full line of PAPER HANDLING ATTACHMENTS.**

You can speed handling, stack higher, cut costs with HYSTER paper handling trucks. Ask your Hyster dealer for a demonstration or write for brochure to Hyster Company, P. O. Box 847, Danville, Illinois.

HYSTER COMPANY
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monotrol

ONLY HYSTER TRUCKS HAVE monotrol

. . . the "human engineered" control system that means higher production through increased operator efficiency. Monotrol pedal provides natural *right* foot control of forward-reverse shifting and speed, leaving the operator's hands free for full-time steering and load control. A Hyster exclusive available now on SpaceSaver trucks in 3,000, 4,000, and 5,000 lbs. capacity.

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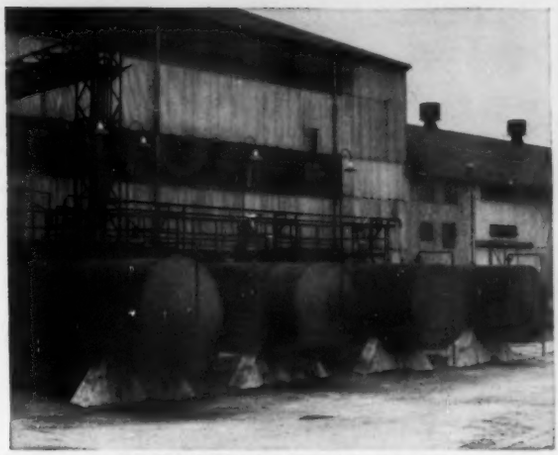
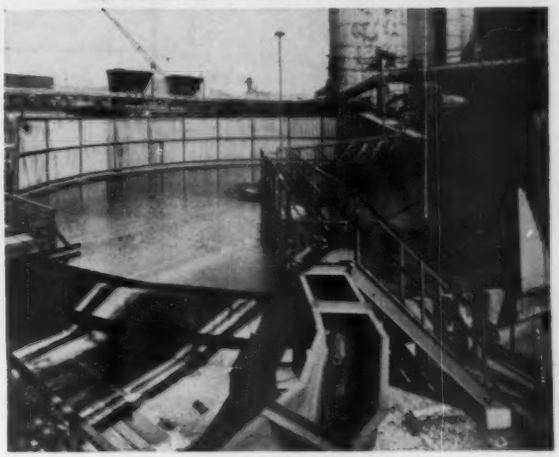
Where's Your Toughest Corrosion Problem?

UNDERGROUND STEEL?



CHEMICAL SPILLAGE?



WASTE TREATMENT?

There's a time-tested TARMASTIC® coating to lick each one—economically and "for keeps!"

There's hardly a corrosion problem in your plant that can't be stopped dead-in-its-tracks with a Pitt Chem TARMASTIC coal tar coating. There are seven different Tarmastic coatings to select from. Each one is formulated to solve a specific type of corrosion problem.

These tough, heavy-duty coatings are so resistant to moisture and industrial corrosion that they'll outlast a dozen applications of ordinary protective paints. Yet they cost no more per gallon. Tarmastic coatings are readily applied by brush, spray or roller.

Begin cutting corrosion costs at *your* plant with a complete Tarmastic protection program! No other type of coating can do such a *complete* job of protection . . . at so *little* cost!

The first step is to call your local Industrial Distributor who handles Pitt Chem Industrial Coatings. Write for his name . . . or check the "Yellow Pages" of your telephone directory.

★ PITT CHEM "Insul-Mastic"® Gilsonite-Asphalt Coatings
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COOPER ALLOY VALVE BRIEFS

THE VALVE AND FITTINGS ANSWER CORNER

Send in your questions on stainless valves and fittings to Carl Tylka, Cooper Alloy Technical Service Director.

Q. *Is it possible to obtain a valve which, like a globe valve, possesses linear throttling characteristics, but which also, like a gate valve, has low fluid pressure drop across it when fully opened?*

A. Not throughout the entire flow range of the size valve being considered. A very close approximation, however, may be attained with a Flex-Plug type design (a unique new valve patented by Cooper Alloy), which provides linear throttling response up to 90% of full valve flow. The 10% balance of the upper flow region would exhibit a typical gate valve flow pattern.

Q. *How can one prevent oxidation of active ferrite ion on the fluid side of a cast stainless valve body?*

A. This type of corrosion is commonly found on untreated cast stainless surfaces only, and may be caused by foundry, machinery, and handling techniques. Proper pickling and passivation with thorough mechanical cleaning will generally rectify this, though in some cases actual weld repair of the contaminated surface is required. Since this is a surface condition only, machining or grinding will also help.

Q. *What type of valve do you recommend for manual-control services where minimum pressure drop is required?*

A. In the absence of more detailed knowledge of the problem, I would tentatively recommend an angle valve. The pressure-drop characteristics of this type valve are less than 50% those of conventional globe valves.

Q. *Is it advisable to specify installed valve position on an order?*

A. Definitely. By inclusion of this information, definite design considerations can be incorporated, especially in cases where backseat leakages are critical and mechanical valve operation is involved.

Q. *Is it advisable to install valves smaller than the accompanying pipe sizes?*

A. Where flow and pressure considerations so permit, it is not only advisable but also economically beneficial.

Q. *Why aren't valve bodies with butt weld and connections made shorter?*

A. To prevent distortion of the seating surfaces during installation. The longer length is required for heat dissipation during welding.

Above left, Cooper Alloy 16" cast stainless gate valve ready to receive gear motor drive; lower left, Cooper Alloy 12" cast check valve. Both are rated for 2500 psi service at 670°F. Official AEC photo above shows them in place in nuclear process line.

Cooper Alloy cast stainless valves spurt ahead of competition to win acceptance in AEC's Spert III reactor program

Cast yield strengths of 23,000 psi, plus cost savings of 40%, do the trick!

This is a Cooper Alloy success story in another "first": casting of stainless valves and fittings to strength levels actually surpassing those previously possible only in forgings—and doing it all at a 40% saving to the customer!

The story starts, naturally, with the AEC's valve and fitting specifications, which are rugged indeed. They have to be certified to function continually at elevated pressures and temperatures (2500 psi, 670° F.), under which conditions leakage, corrosion, and other operational problems are magnified enormously over those encountered in normal process work.

Prior to turning to Cooper Alloy, the contractor for the AEC cancelled a large valve order from another supplier, because the latter could not meet the exacting physical specs without changing the material specs. Cooper Alloy was given the order on the basis of producing to meet AE and AEC specs. Cooper Alloy valves and fittings are currently in operation in the AEC's Spert III installation at Arco, Idaho. Included are nuclear fittings, and motor and manual operated gate, globe, and check valves in various sizes.

How does Cooper Alloy do it? Through the use of the most advanced foundry methods, meticulous attention to conditions, and an exact balance of chemical composition to develop the maximum strength characteristics inherent in the complex structure of stainless alloys. All products, naturally, are elaborately tested and guaranteed before delivery.

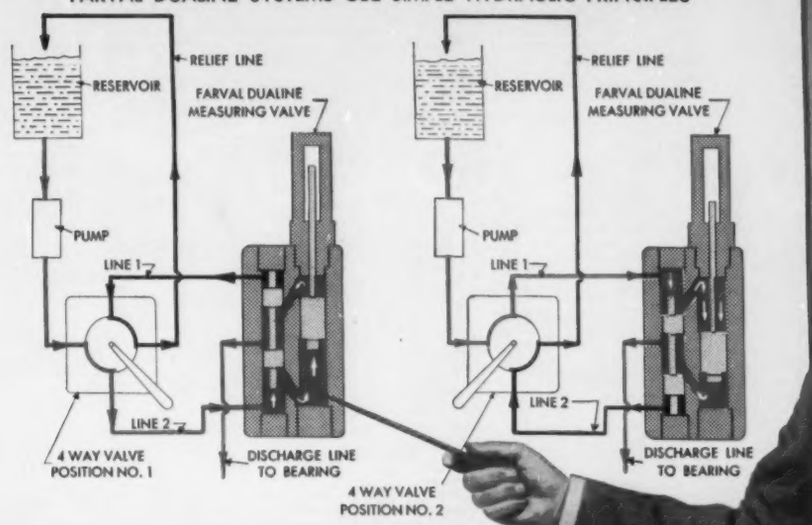
As if the AEC's specs were not stringent enough, there is now a bonus to the story: during production, Cooper Alloy technicians worked out ways of producing cast strengths higher than those required, and proceeded to produce all fittings and valves to these higher, self-imposed standards—at cost savings of 40% over forged valves and fittings!

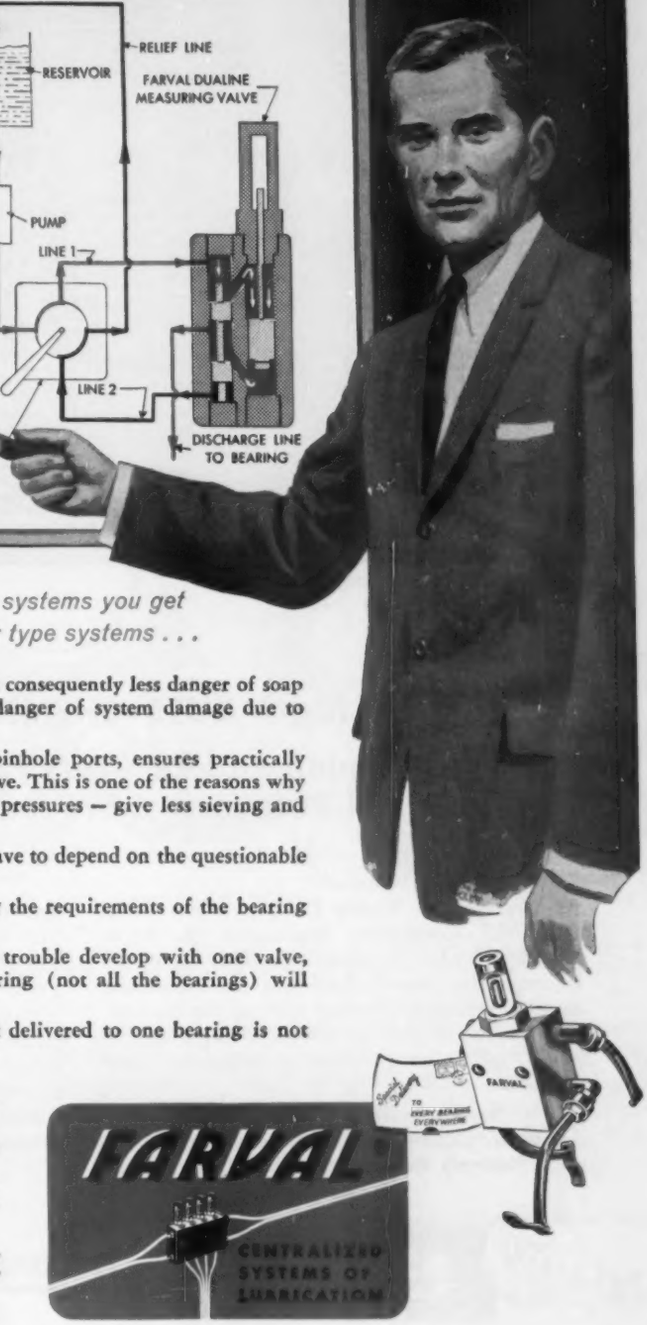
Unusual, yes, but not to Cooper Alloy. It's typical of the quality bonus you get when you buy from Cooper Alloy. For further information, write to Cooper Alloy Corporation, Hillside, N. J.

FARVAL
—Studies in Centralized Lubrication
No. 246

"For positive lubrication of large, medium and heavy-duty installations . . . it's a Farval Dualine System!"

FARVAL DUALINE SYSTEMS USE SIMPLE HYDRAULIC PRINCIPLES





With Farval Dualine centralized lubricating systems you get the following distinct advantages over other type systems . . .

(a) Much lower operating pressures with consequently less danger of soap separation on grease systems. Also, less danger of system damage due to high lubricant pressures.

(b) Large lubricant passages with no pinhole ports, ensures practically full pump pressure for every metering valve. This is one of the reasons why Farval Dualine systems operate on lower pressures — give less sieving and working of lubricants.

(c) Positive indication at each bearing — does not have to depend on the questionable action of a single indicator at the pump.

(d) Each metering valve individually adjustable for the requirements of the bearing it serves.

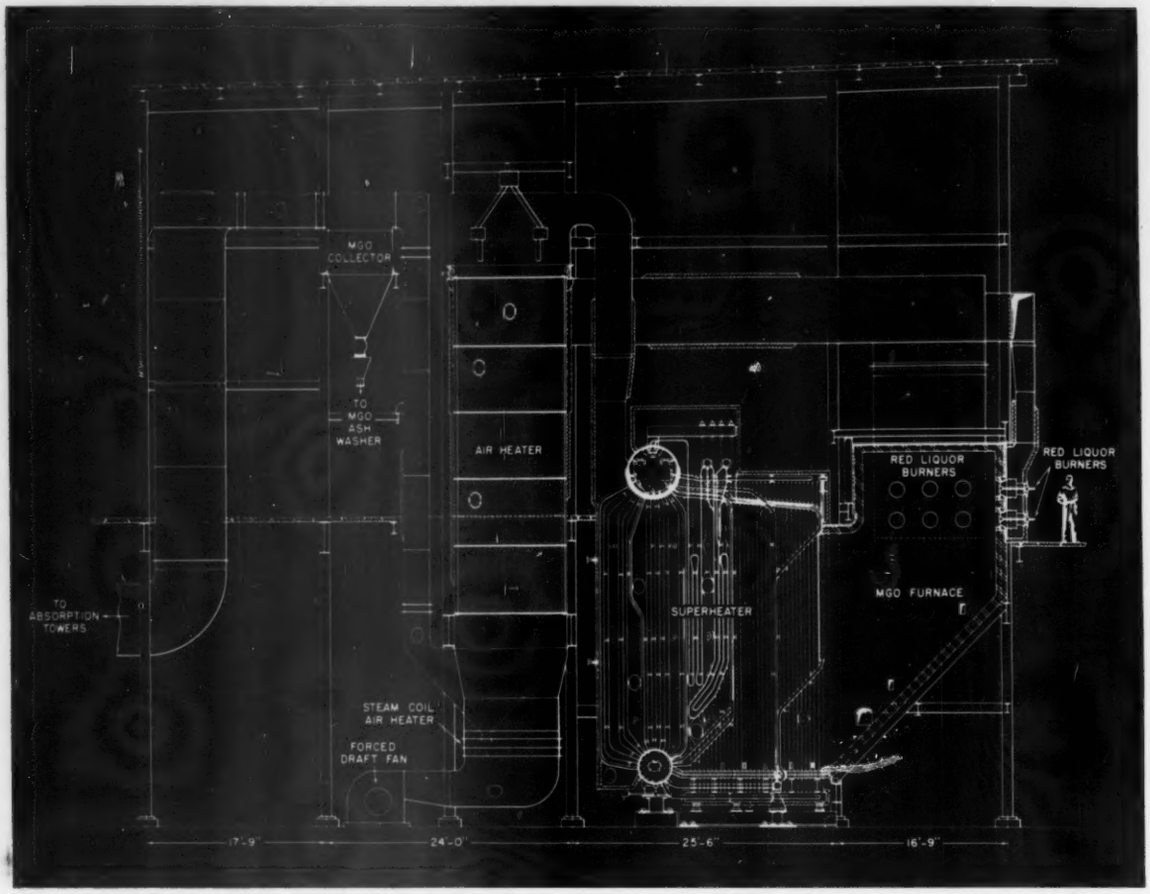
(e) Independent metering valve operation. Should trouble develop with one valve, the system will continue to operate. Only one bearing (not all the bearings) will require hand lubrication until trouble is corrected.

(f) True lubricant metering. Quantity of lubricant delivered to one bearing is not dependent on any other valve in the system.

(g) Much easier to spot and correct trouble.

Check with your Farval Representative and see how these versatile systems can improve production operations — reduce costs. Or write for free Bulletin 26-T containing complete engineering information on Farval Dualine systems. The Farval Corporation, 3268 East 80th Street, Cleveland 4, Ohio.

Affiliate of The Cleveland Worm & Gear Company
A subsidiary of Eaton Manufacturing Company



B&W MgO Recovery Unit processes 550,000 pounds of red liquor solids per day, generates 115,000 pounds of steam per hour at 850 psi and 825 F at the superheater outlet.

MgO CUTS CHEMICAL COSTS

B&W MgO Pulping and Recovery Process Sets New Standards for Chemical Recovery at Weyerhaeuser Sulfite Pulp Mill

At Weyerhaeuser Timber Company's new sulfite Pulp Mill, Cosmopolis, Washington, the B&W MgO Pulping and Recovery Process has established an impressive record of efficient and economical chemical recovery. *Chemical make-up for the complete process is only 20 pounds of MgO and 50 pounds of sulfur per ton of unbleached pulp produced.*

Low chemical make-up and high steam generation reduce pulping costs. For this reason, the B&W MgO Recovery Process has rightfully earned the acceptance of the Pulp Industry. Start-up of the fifth MgO pulping and recovery installation during 1959 will increase pulp production by this process to 650,000 tons per year.

Talking over your chemical and heat recovery problems with B&W can be your first step toward reducing pulping costs and increasing profits. Why not write today for complete information? The Babcock & Wilcox Company, Boiler Division, Barberton, Ohio.

P-821

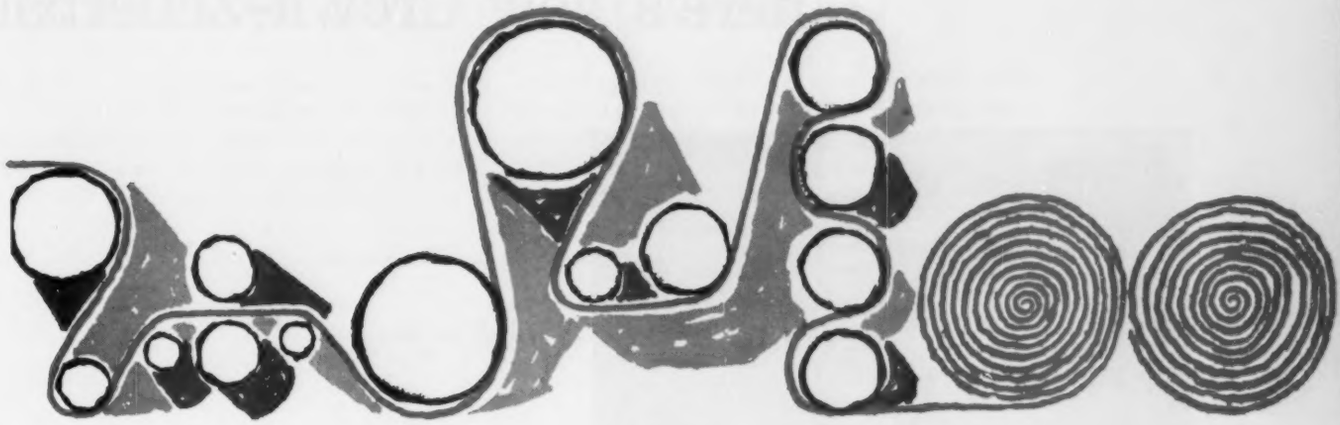
B&W

THE BABCOCK & WILCOX COMPANY

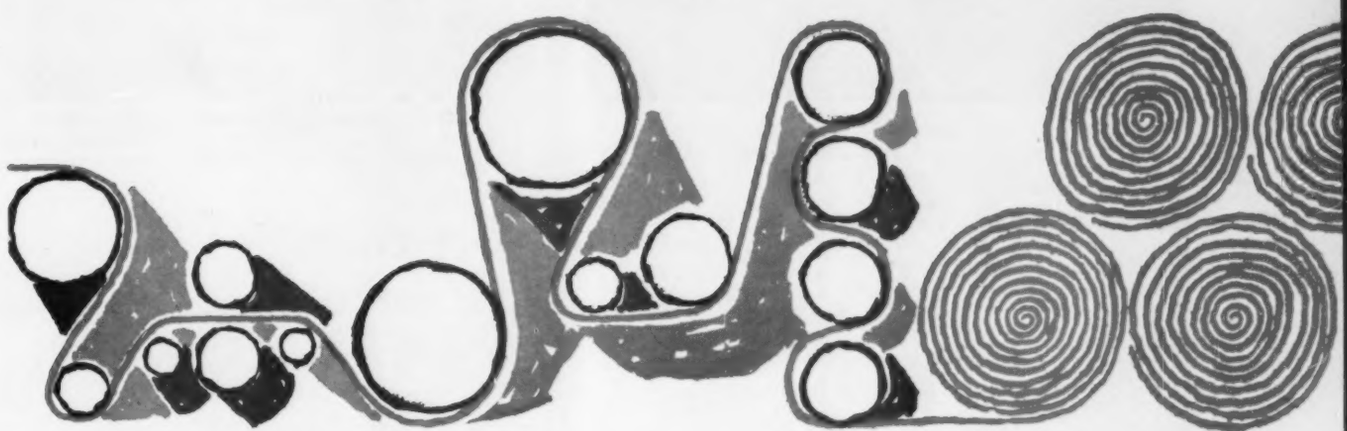
BOILER DIVISION

plan now to

POWER-UP FOR PROFIT ELECTRICALLY



Crown-Zellerbach did at Port Townsend, Washington



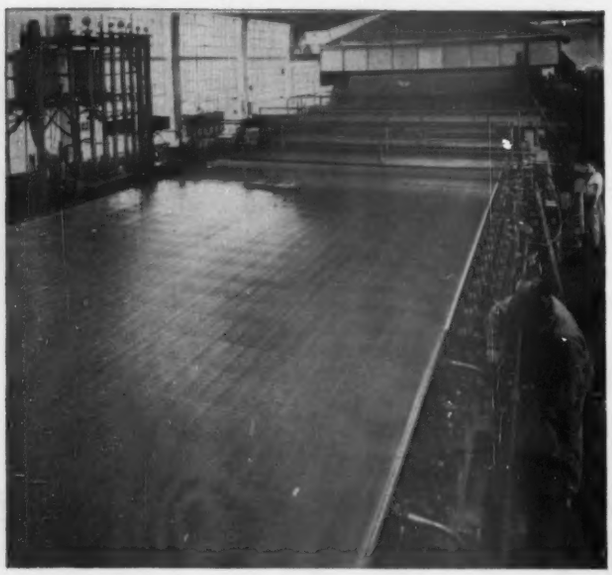
increased capacity . . . reduced unit costs

When Crown-Zellerbach Powered-Up the Number 2 paper machine at its Port Townsend plant, a modernized electric sectional drive helped increase operating speed, widen the speed range and provide greater availability. Results . . . increased capacity, reduced unit costs.

You will need more capacity to meet the 40% increase in demand for your products by 1965. Be sure that your electrical equipment will produce profits as well as output. See how Westinghouse helped Crown-Zellerbach to Power-Up the Number 2 paper machine at its Port Townsend plant. J-96136-1

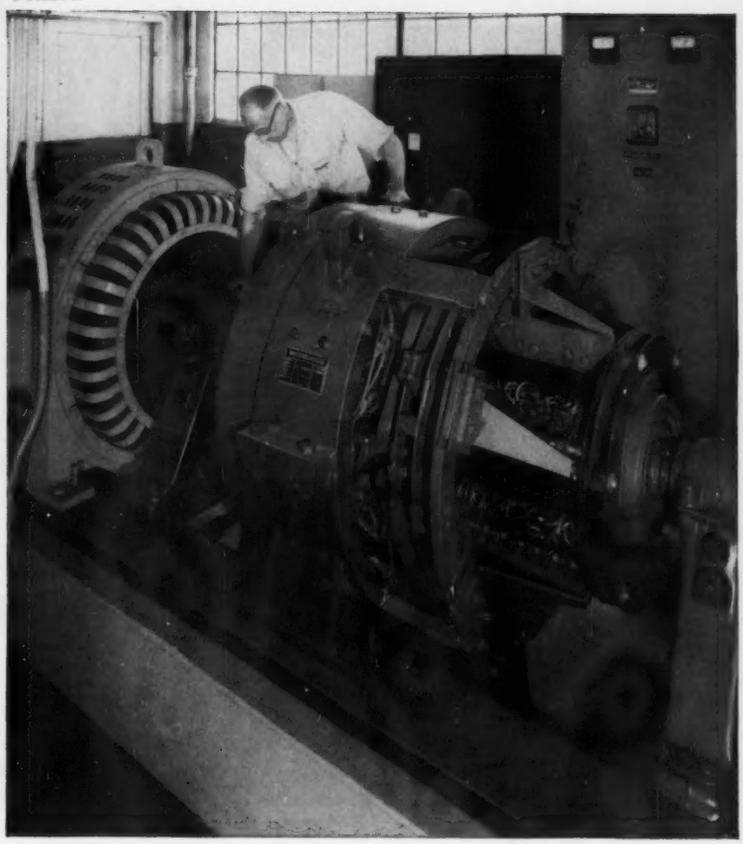
YOU CAN BE SURE...IF IT'S **Westinghouse**

here's how Crown-Zellerbach



Wet end view of modernized Number 2 paper machine in Crown-Zellerbach plant, Port Townsend, Washington.

J-96136-2



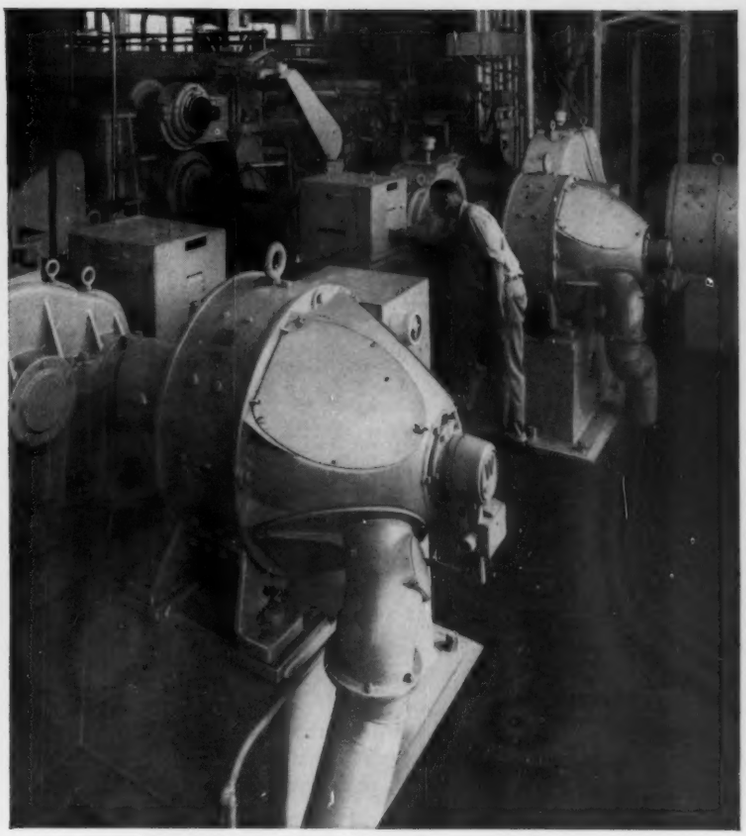
This 3000-amp, 75-volt booster generator was added to increase operating voltage and thus permit higher speeds. SLIPSYN® high-voltage synchronous motor control starter for the driving motor is shown in background.

POWERED-UP at Port Townsend

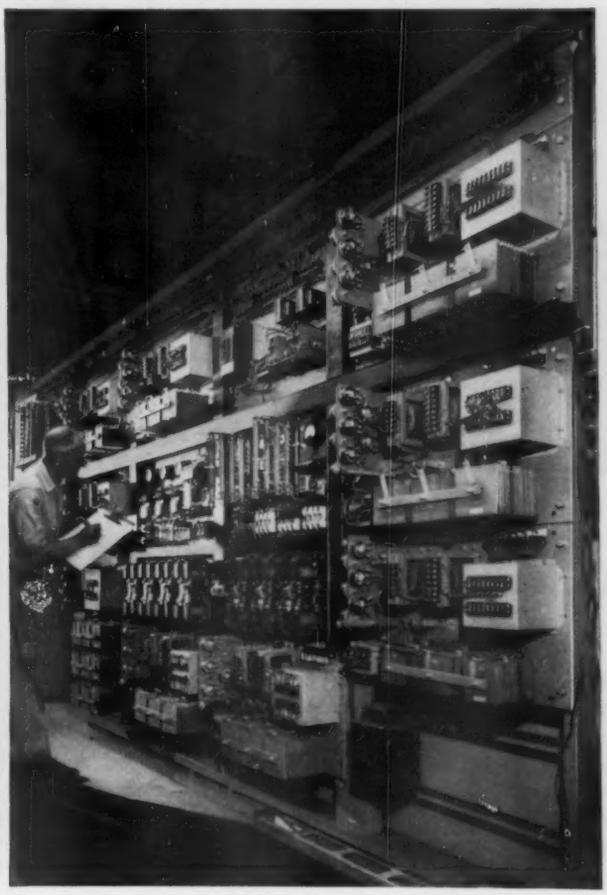
Modernization of the Number 2 paper machine at Crown-Zellerbach's Port Townsend, Washington, plant increased rated top speed from 1050 ft/min to 1750 ft/min. Also, the speed range was widened from 300-1050 ft/min to 480-1750 ft/min. The increased operating speed and range flexibility, plus the greater availability provided by static Magamp control, all contributed to a reduced cost per ton. All this was accomplished at minimum cost by building around the existing magnetic control.

J-96136-3

YOU CAN BE SURE...IF IT'S Westinghouse



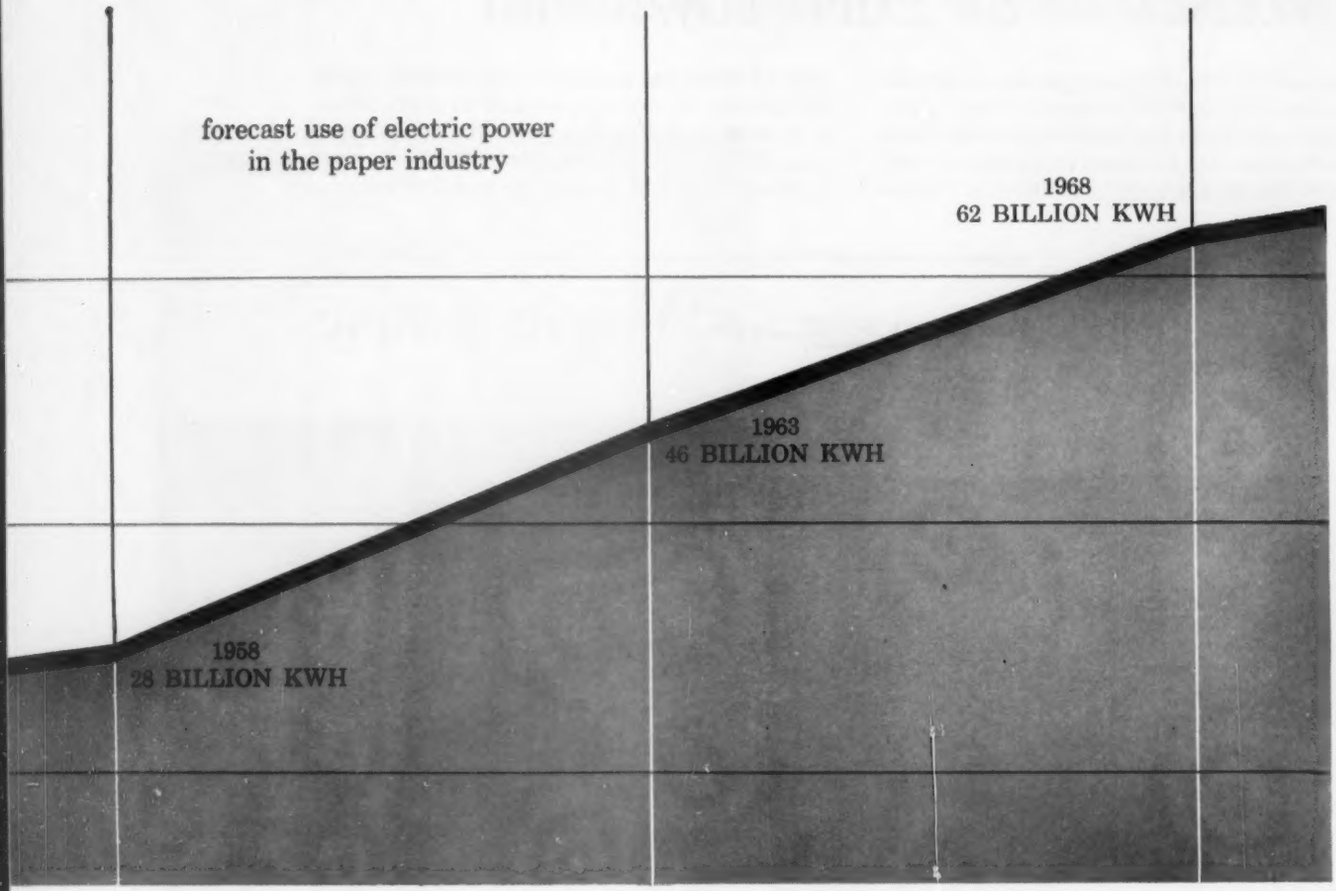
These 100- and 125-hp press motors are integrally mounted with the Westinghouse reducers to conserve space and permit accessibility. These unitized sections were installed to meet the increased power requirements. Drive units on the press section and couch motor are shown in the background.



Lead electrician checks Magamp, a static control-type regulator. The use of static components in this control system results in infinite life and minimum maintenance. Greater machine availability and increased production are assured. Magamp panels were installed in the existing magnetic control board.

here's why you should plan now to

POWER-UP FOR PROFIT ELECTRICALLY



To stay competitive, you will be investing in a tremendous increase in electrically powered processing machinery. Be sure it is engineered to produce profits.

Power-Up is a Westinghouse program to help you increase profits through greater productivity. In your plant it may be higher capacity machinery or an engineered control system to provide more uniform production. Whatever the need, maximum use of low-cost kilowatthours can help you earn satisfactory profits.

You will need more capacity to meet the 40% increase in demand for your products by 1965. Be sure—like Crown-Zellerbach—that your electrical equipment is engineered to produce profits as well as output. Call your Westinghouse representative or your utility power sales engineer. They can tell you the electrical steps you can take now to start a Power-Up program in your plant.

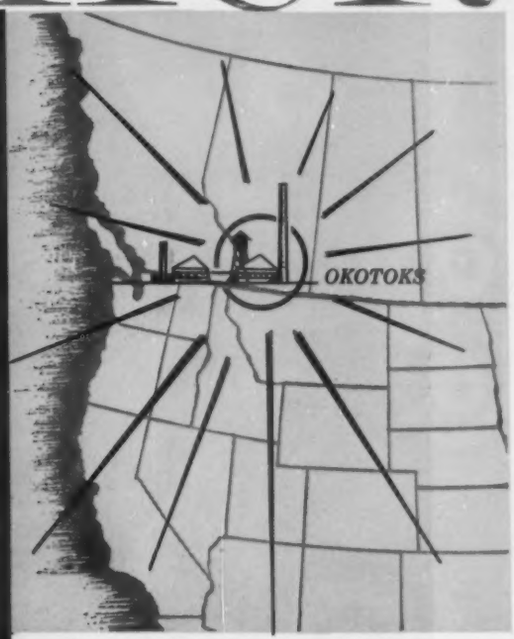
J-96136-4

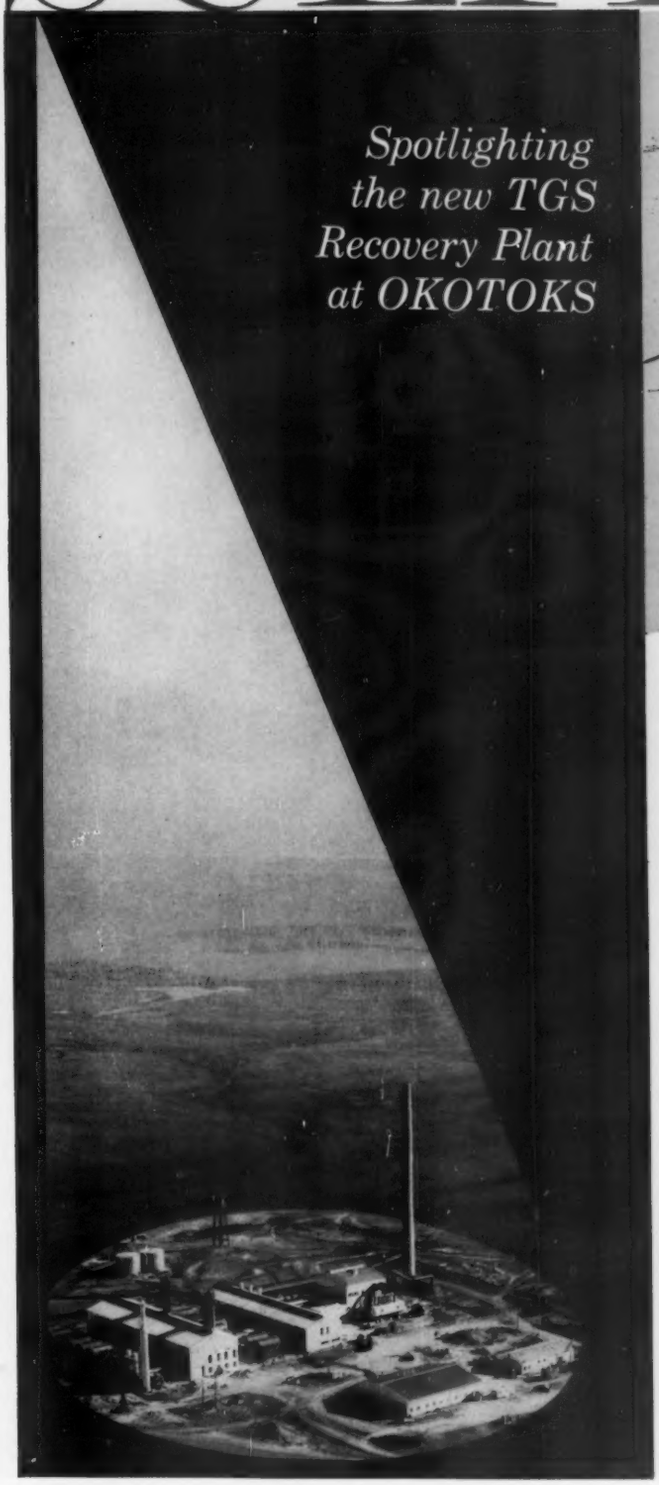
YOU CAN BE SURE...IF IT'S **Westinghouse**

WATCH "WESTINGHOUSE LUCILLE BALL-DESI ARNAZ SHOWS" CBS TV FRIDAYS

SULPHUR

Spotlighting the new TGS Recovery Plant at OKOTOKS





OKOTOKS marks another step in the steadily broadening service being developed by TGS for industries in the States and Canada. Production from OKOTOKS, sitting on top of the vast "sour gas" field a few miles south of Calgary, Alberta, will add a significant tonnage to the supplies of Sulphur already available through TGS to the expanding industries in the Pacific Northwest. OKOTOKS is set up to make shipments of Sulphur in solid or molten form.

TEXAS GULF SULPHUR COMPANY
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Sulphur Producing Units:
Newgulf, Texas • Spindletop, Texas • Moss Bluff, Texas
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Here's Why

Masoneilan Model 4811
D. P. Transmitters
Give You Top Performance

These essential features of the Masoneilan design assure optimum performance in differential pressure, flow or liquid level applications . . .

- **Accuracy** within 1% of range span, plus fast response, and minimum hysteresis and nonlinearity. There is no distortion due to outside forces acting on cover and damping is built in at measurement source. Static pressure effect is less than 0.2% per 100 psi change.
- **Rugged Construction** provides complete protection due to overload, negative differential or overranging. Rigid mounting for horizontal or vertical surfaces. All working parts exposed to process fluid are made of Type 316 stainless steel. Extra heavy beam avoids bending.
- **Versatility** — range adjustable between 20 and 200 inches of water; suppression up to 50 inches. Suitable for differential pressure, flow, or liquid level applications.

Investigate all the advantages these improved transmitters offer you. Bulletin with full specifications sent on request.

MN7-40

MASON-NEILAN

Division of Worthington Corporation

65 NAHATAN STREET, NORWOOD, MASSACHUSETTS

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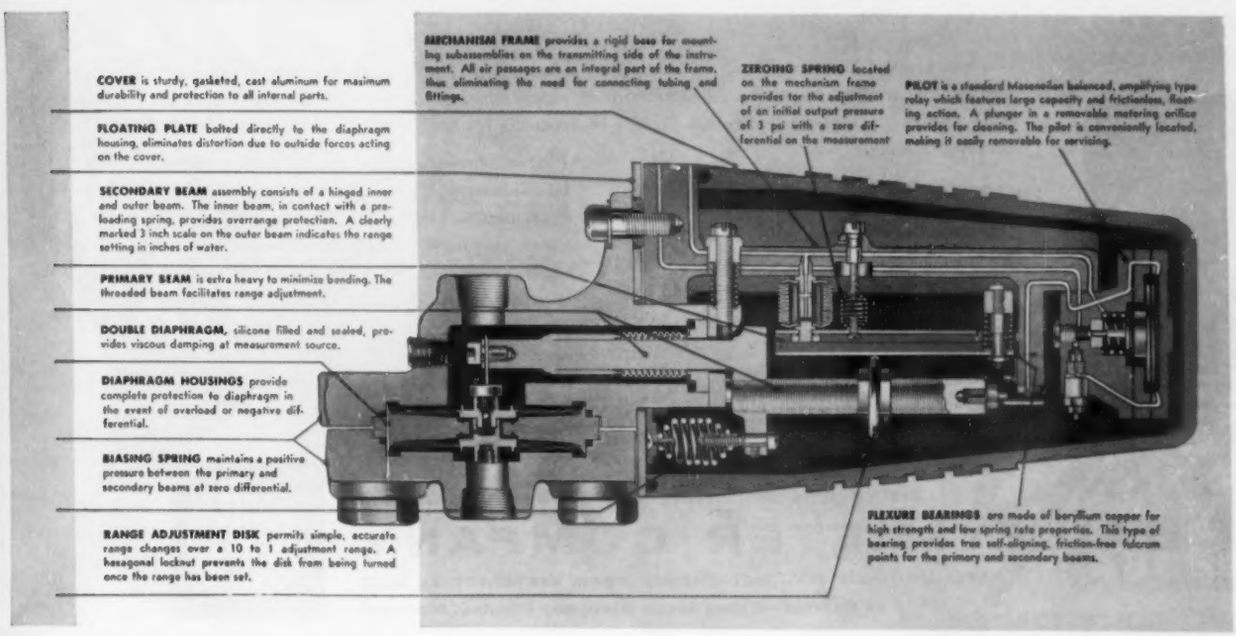
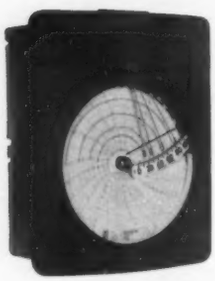

COVER is sturdy, gasketed, cast aluminum for maximum durability and protection to all internal parts.
FLOATING PLATE bolted directly to the diaphragm housing, eliminates distortion due to outside forces acting on the cover.
SECONDARY BEAM assembly consists of a hinged inner and outer beam. The inner beam, in contact with a preloading spring, provides overrange protection. A clearly marked 3 inch scale on the outer beam indicates the range setting in inches of water.
PRIMARY BEAM is extra heavy to minimize bending. The threaded beam facilitates range adjustment.
DOUBLE DIAPHRAGM, silicone filled and sealed, provides viscous damping at measurement source.
DIAPHRAGM HOUSINGS provide complete protection to diaphragm in the event of overload or negative differential.
BIASING SPRING maintains a positive pressure between the primary and secondary beams at zero differential.
RANGE ADJUSTMENT DISK permits simple, accurate range changes over a 10 to 1 adjustment range. A hexagonal locknut prevents the disk from being turned once the range has been set.
MECHANISM FRAME provides a rigid base for mounting subassemblies on the transmitting side of the instrument. All air passages are an integral part of the frame, thus eliminating the need for connecting tubing and fittings.
ZEROING SPRING located on the mechanism frame provides for the adjustment of an initial output pressure of 3 psi with a zero differential on the measurement
PILOT is a standard Masoneilan balanced, amplifying type relay which features large capacity and frictionless, floating action. A plunger in a removable metering orifice provides for cleaning. The pilot is conveniently located, making it easily removable for servicing.
FLEXURE BEARINGS are made of beryllium copper for high strength and low spring rate properties. This type of bearing provides true self-aligning, friction-free fulcrum points for the primary and secondary beams.

To give your operation "FOUR-IN-ONE" efficiency...

The BAILEY Receiver Recorder-Controller!



Records four variables on one chart.

You can lower the cost of your equipment investment and increase the efficiency of your entire operation with the Bailey Receiver Recorder.

HERE'S HOW

The interchangeable components for the Recorder make it fast, inexpensive, and automatic to do up to *four* measuring jobs at the same time with either or both pneumatic and electric systems.

This Bailey unit continuously and simultaneously records four variables on the same chart. And, they are *in the same linear scale measurement.* You have clear, easy-to-read records for continual analysis and control.

Plug-in, pre-calibrated receivers can easily be adapted on-the-job to revised process requirements. The Bailey Receiver Recorder saves you money with a minimum instrument investment for process cycle expansion or alteration. Let your local Bailey engineer suggest applications to fit your operation. Or write for specific control systems information for your entire plant operation.

P44-1

Instruments and controls for power and process

BAILEY METER COMPANY

PAPER AND PULP DIV., 1037 IVANHOE ROAD, CLEVELAND 10, OHIO

In Canada—Bailey Meter Company Limited, Montreal

NEW Griffith TANSTONE

SIZE PRESS COVERING

Laughs Off Heat, Pressure, Abrasion

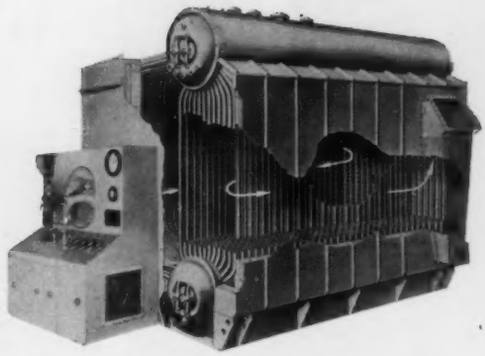
The new "TANSTONE" roll covering has been developed after considerable Griffith research to give superior service in size press, or wherever heat is of paramount importance on modern high speed paper and board machines. The exclusive "TANSTONE" formula produces a smooth, super-hard surface that has great resistance to heat and abrasion. It provides new production dependability and reduces costly "down time".

Write, wire or phone for information and a time estimate on your job.

Griffith RUBBER MILLS

MAIN OFFICE — 2439 N. W. 22nd Avenue
Portland 10, Oregon
Telephone: CApitol 3-7126

C-E Power Boilers for the Pulp and Paper Industry



C-E Package Boiler, Type VP—Completely shop-assembled . . . available in 23 sizes from 4,000 to 90,000 lb of steam per hr capacity . . . pressures to 700 psi . . . temperatures to 750F in certain sizes . . . available with integral console control panel. This unit contains more water-cooled area per cubic foot of furnace volume than any other boiler of its size and type. For oil or gas firing.

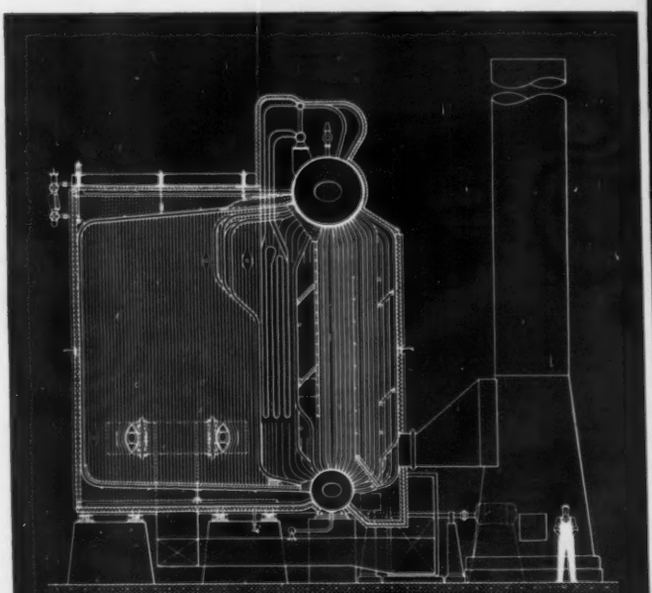
C-E offers boiler designs for any pressure, temperature and capacity . . . for any fuel or combination of fuels. The units illustrated here include both standard and custom designs with capacities from 4,000 to 750,000 lb of steam per hr, with pressures to 1350 psi and steam temperatures to 950F. Two units are for oil or gas firing. The other four are available for coal, oil, gas or bark firing—either singly or in any desired combination. In addition to those illustrated, there are other designs available for more specialized applications.

Whether you wish to add steam capacity to your present power plant — or build a single large boiler to meet all your steam needs — these units allow you a freedom of choice never before available. In addition to making full utilization of your bark supply, you can choose a supplemental purchased fuel best suited to the economics of your area for use when your bark supply is inadequate or your steam needs exceptional.

All these boilers have been proved in operation. They perform reliably and economically and — no matter what your combination of fuels or steam conditions — are designed to meet your needs exactly.

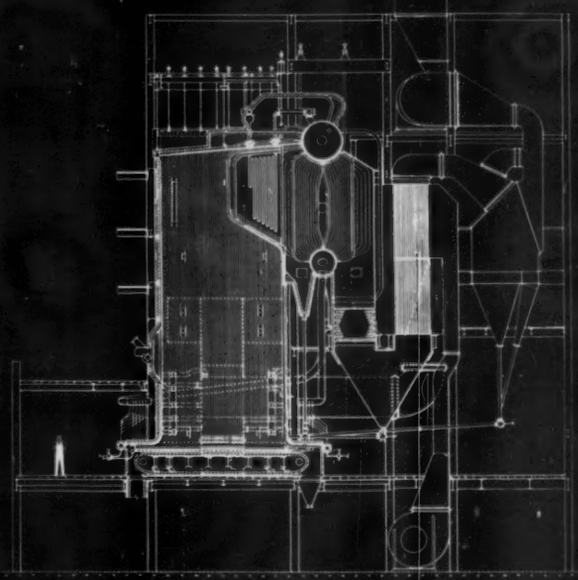
For further information, contact the C-E office nearest you. Or, if you prefer, write or phone the C-E Paper Mill Division in New York.

C-198A

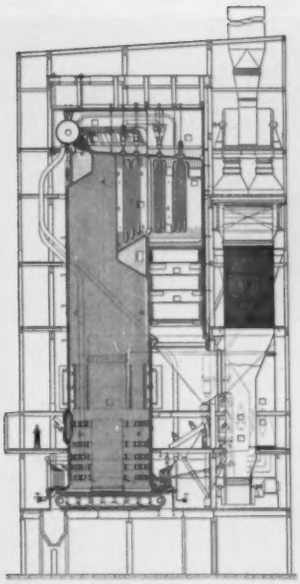


C-E Vertical-Unit Boiler, Type VU-55 — Available in five sizes . . . capacities from 50,000 to 120,000 lb of steam per hr . . . designed for three pressure ranges: 250, 500 and 700 psi, and total steam temperatures up to 750F. Equipped with tangential burners, 60-inch steam drum assures generous water capacity and steam reservoir space. Tangent tube waterwalls offer complete furnace protection, minimizing maintenance. For oil or gas firing. Available with heat recovery equipment, if desired.

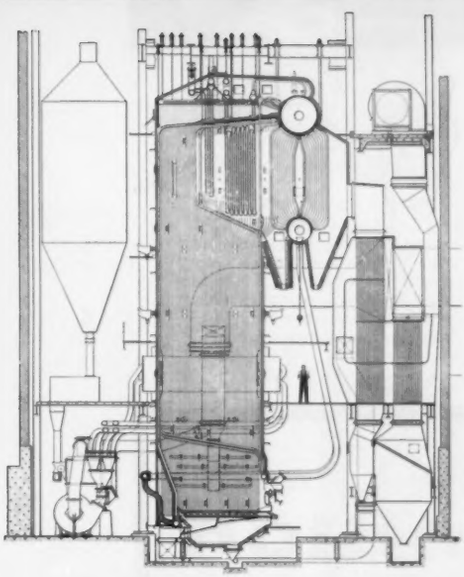
These drawings show but a few of the many types of C-E boilers available for pulp and paper mill use which burn two or more fuels. Not illustrated here is the C-E Chemical Recovery Unit.



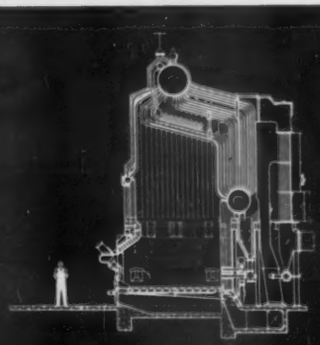
C-E Vertical-Unit Boiler, Type VU-40 — fired by C-E Tilting Tangential Burners and a C-E Continuous Discharge High Set Spreader Stoker. This unit is designed to burn natural gas, oil, coal and bark . . . a baffleless boiler with capacities ranging to about 300,000 lb of steam per hr with pressures to 1350 psi, temperatures to 950F.



C-E Radiant Type Boiler — Type RX — for bark, oil, natural gas, stoker or pulverized coal firing in any combination. Available in capacities to 750,000 lb of steam per hr, with pressures to 1350 psi and temperatures to 950F. The unit pictured is fired with a C-E Continuous Discharge High Set Spreader Stoker and C-E Tilting Tangential Burners.



C-E Vertical-Unit Boiler, Type VU-40 — for capacities to about 300,000 lb of steam per hr, pressures to 1350 psi and temperatures to 950F. For pulverized coal and bark firing, singly or in any combination. The unit illustrated is equipped with C-E Bowl Mills, C-E Tilting Tangential Burners and a C-E Dump Grate Spreader Stoker.



C-E Vertical-Unit Boiler, Type VU-10—fired by a bark and coal burning C-E Spreader Stoker. VU-10 Boilers are available for capacities to 50,000 lb of steam an hr, with pressures to 500 psi and temperatures to 650F. This unit type is available for coal, oil, gas or bark firing — singly or in combination.

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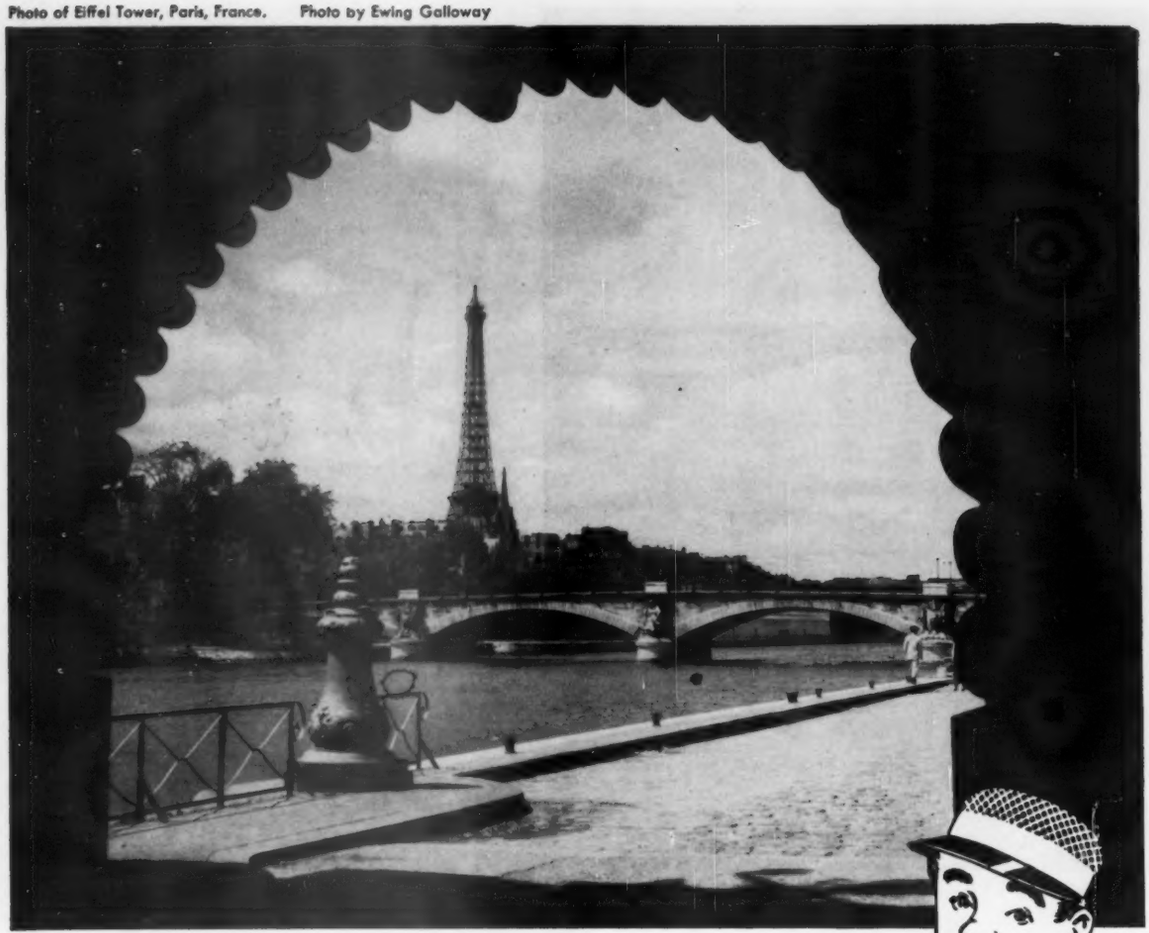
Photo of Eiffel Tower, Paris, France. Photo by Ewing Galloway



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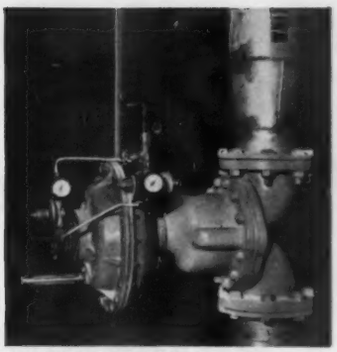
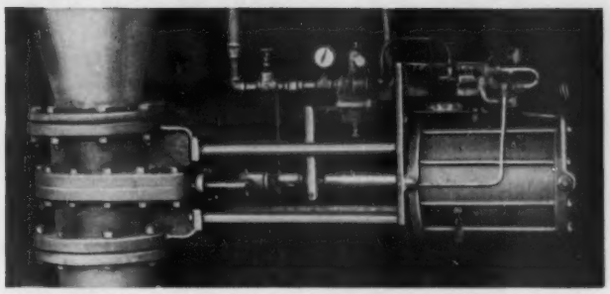


SAUNDERS VALVE (Conoflow close-coupled type) affords automatic throttling control of white water in bleach plant at Marathon Southern's Naheola, Alabama mill. Conoflow is the world's largest producer of Saunders valves for automatic control.



PULP STOCK VALVE (8" Walworth with Conoflow actuator) on automatic control service at Crossett Paper Mills, Crossett, Arkansas. Conoflow actuated pulp stock valves are available in all sizes.

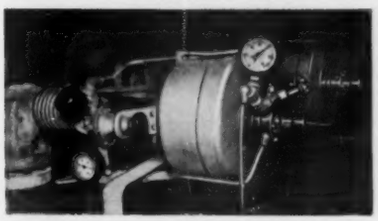
CONOFLOW

CONTROLLED FLOW

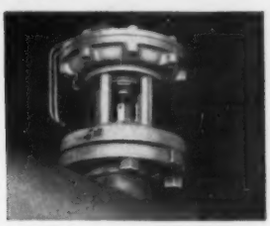
AUTOMATION IN PAPER MAKING

The installations shown here are typical of how Conoflow final control elements have helped bring automation to the pulp and paper industry. Conoflow products make possible faster, more efficient operations, and substantial savings of costly process fluids for many modern paper mills.

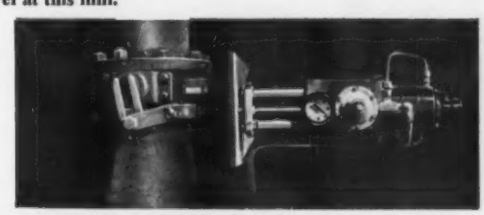
VALUABLE DATA FREE! To find out where automatic process control can help you, write for Bulletin MD-1 *Application of Conoflow Equipment in Modern Pulp and Paper Making Processes.* Also ask for reprint *How to Use Standard Pulp Valves for Throttling Control*—a thought-provoking and informative article. Both will be mailed to you promptly, without obligation. Dept. C-901, Conoflow Corporation, 2100 Arch Street, Philadelphia 3, Pa. Conoflow engineering representatives are located in principal cities throughout the world.



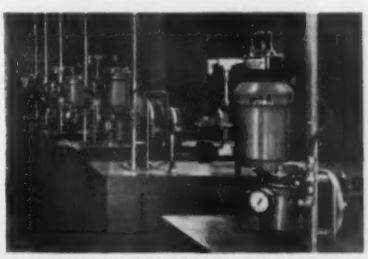
CONTROL VALVES (Conoflow Series LB) on a tough service at the R-W Paper Company plant in Longview, Washington. These 2" single-seated angle valves are handling steam at 700°F. and 600 psi with a 580 lb. pressure drop.



PRESSURE TRANSMITTERS (Conoflow Model P) measuring pressure of pulp stock during bleaching process at the P. H. Glatfelter paper plant in Spring Grove, Pa. This is one of several Conoflow Model P's measuring pressure and liquid level at this mill.



BUTTERFLY VALVE (Conoflow actuated) on automatic control service at Crossett Paper Mills, Crossett, Arkansas.



CURRENT CONTROLLERS (Conoflow Model EB) regulating speed of washer thickeners in bleach plant at Marathon Southern mill in Naheola, Alabama. The Model EB is a unique pneumatic-electric transducer—a Conoflow exclusive for the paper industry.

CONOFLOW CORPORATION

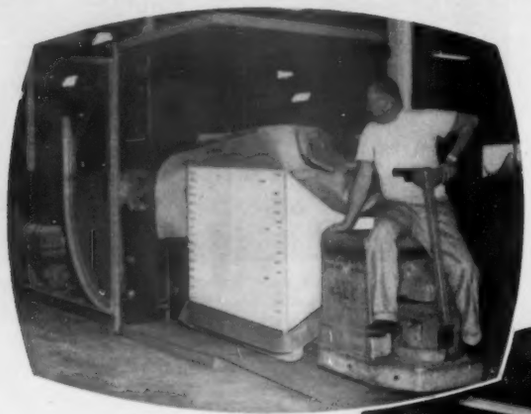
FOREMOST IN FINAL CONTROL ELEMENTS

SUBSIDIARY WALWORTH

HOW THE SOUTHWORTH SKID TURNER

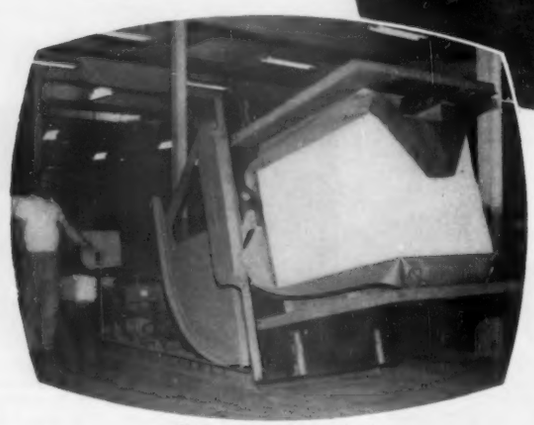
increased efficiency

AT CHILLICOTHE

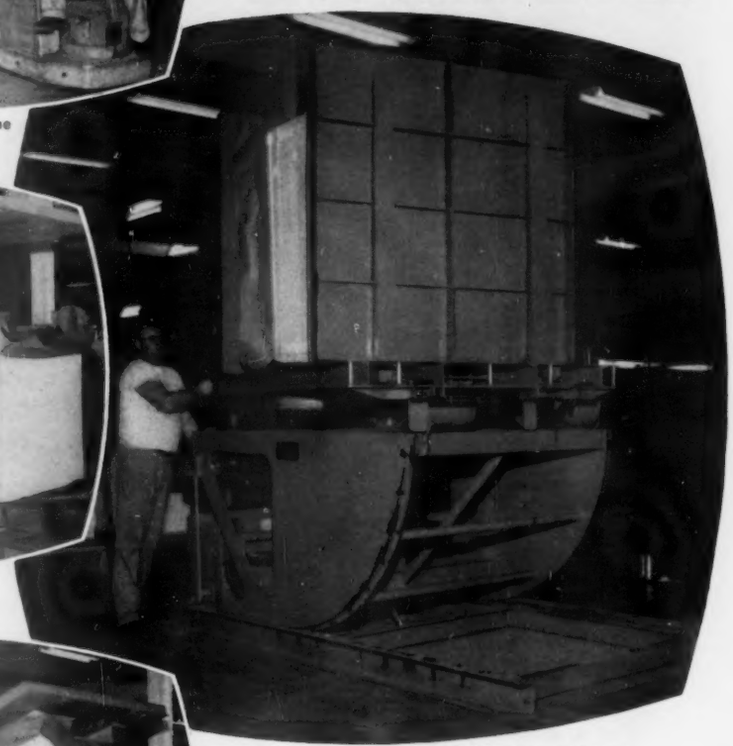


Skid is positioned on the skid turner.

Jaws start to close, clamp skid firmly.



Skid is lifted, revolved, reversed, and lowered.



Photos Courtesy of Chillicothe Paper Company

Chillicothe Paper Company found that hand-turning a skid of paper, ream-by-ream, was time consuming and expensive. Yet an accurate trim on papers embossed one side only was difficult unless the paper laid flat. The double problem no longer exists, however . . . thanks to the Southworth Skid Turner in its finishing department!

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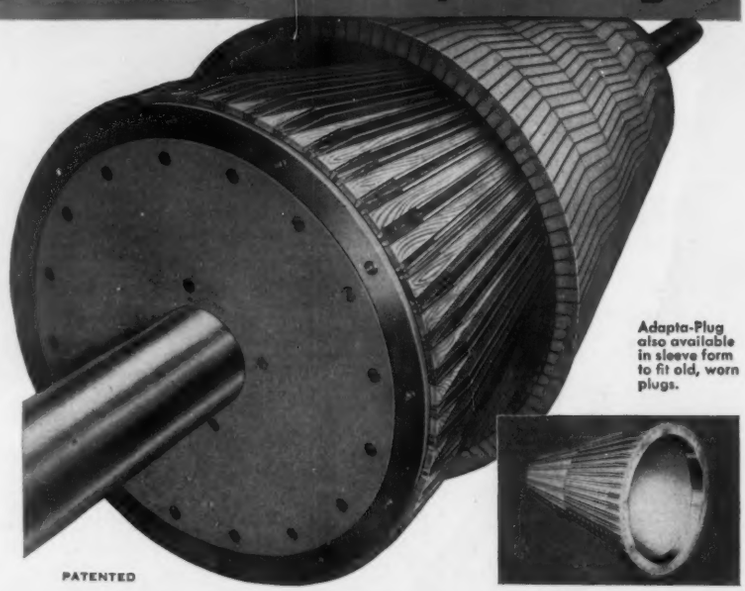

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Adapta-Plug also available in sleeve form to fit old, worn plugs.

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Unlike sectional fillings, rigid Fulbar readily compensates for inequalities in old shell body.

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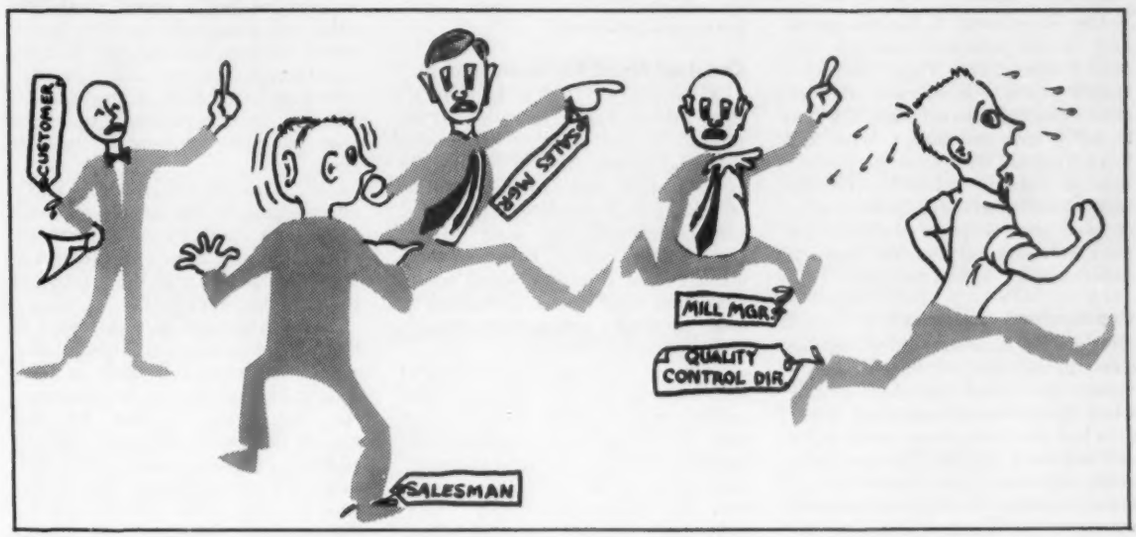


Better Quality Control

Twenty Experts Give Views on Quality Control

Industry experts pull no punches in expressing the needs of a good quality control program. Despite disagreements, these points are clear:

1. Efficacy depends on cooperation.
2. Profits cannot be forgotten.
3. Efficient organization is vital.
4. Customer is king.
5. Present needs are great.
6. The future holds the key.

PULP & PAPER Presents Another "Blue Ribbon Panel"

Experts from 20 American mills or company-headquarters—East, West, South and North—present their views in this Blue Ribbon Panel, organized by PULP & PAPER.

WE TELL YOU WHO THEY ARE (see list and pictures).

They are a carefully selected group, well known in this industry for their experience with quality control problems.

BUT WE DON'T TELL YOU WHO SAID WHAT.

That's so they would speak more frankly. As you read this article, you may try to guess who is talking. But we're not telling.

This technique — as used in previous PULP & PAPER Blue Ribbon Panels—again has brought forth provocative and valuable ideas.

• Quality control has been vital to the making of pulp and paper since the very beginnings of the industry. It is true that the early tests were crude —consisting of tearing the paper, folding it, shaking the sheet to determine whether it had good rattle, dropping water on the sheet to determine whether it was sized and looking at the brightness and the color.

This type of control was satisfactory at the start, because paper did not have to undergo the rugged performance that it does today. In those early days the paper mill superintendent was the quality control director; and the supervisors, machinetenders, backtenders and windermen were members of the quality control department.

With the development of control

testing equipment, it became necessary to add personnel charged with testing operations. Thus evolved a quality control department. As machine speeds increased from 200 fpm to 1,500 fpm and higher, more and more emphasis was placed on production. It became impossible for the superintendent to check on the quality of each reel of paper and also for machine crews to watch the paper as closely as they had in the past.

Unprejudiced Judgment

Additional inspectors aided machine crews in watching for defects and advising the machinetender quickly when quality was off standard. These men had the authority to reject paper and request it remade. The new baby at the mill—the quality control department—reported directly to the general manager. The principal reason for the change was to obtain an unprejudiced judgment of quality. In this department were the quality control director, the machine inspectors and the paper testers.

Next step in evolving modern quality control was the addition of performance testing equipment. This resulted from the realization that physical tests did not always indicate for certain whether the paper would perform satisfactorily.

Constant Need for Improvement

A member of PULP & PAPER's Blue Ribbon Panel comments on the future: "It has been our experience that the automation of production equipment, as well as the automation of testing and regulating apparatus, has contributed the most toward better quality control. However, there are still many tests and testing equipment that need to be automated in order to obtain better, more reliable and dependable control.

"The trend, of course, has been and will continue to be toward higher quality demands from customers for even the lowest grades. Quality and quality control may even be of greater importance for the lower paper grades than the higher—particularly where high-speed presses or converting equipment is involved."

For the Small Mill: A Problem

"Regardless of the size of the organization," another panel member advises, "sufficient quality control is necessary to produce a product that will do the job for which it was intended and do it consistently.

"In our small mill quality control is more or less a group effort. Our sales staff is specially sensitive to customer reaction, and our operators and hourly-paid employes alike are conscious of the necessity of good quality. This is more of a personal proposition than will be found in larger organizations.

"We evaluate our quality control effectiveness by the results of check inspections made by our supervisors; observations made by our salesmen in customers' plants, and the reaction of the customer himself.

"Automation can be of assistance in those elements of quality control that are easily measurable such as basis weight, caliper, opacity, transparency, etc. But, these are not the real sources of trouble. The most difficult elements of quality control deal with those abstract properties that determine how the paper will perform for the customer. Much of this breaks down to a matter of human judgment.

Uniformity Most Important

"Regarding the most significant recent developments in quality control, it seems to me that the application of statistics; the introduction of new and better instruments, and increased at-

Twenty Experts Give Views on Quality Control

WILLIAM H. AIKEN
Director of Research & Development, Diamond Gardner Corp., Middletown, O.

RAYMOND E. BAKER
Manager of Manufacturing, Pulp Div., Weyerhaeuser Co., Tacoma, Wash.

B. CROCKER JR.
Vice President and Treasurer, Crocker, Burbank & Co. Assn., Fitchburg, Mass.

DR. L. V. FORMAN
General Manager, Scott Paper Co., West Coast Div., Everett, Wash.

F. R. HAMILTON
Director of Research & Product Development, Simpson Paper Co., Everett, Wash.

R. E. HARPER
General Manager, R-W Paper Co., Longview, Wash.

DAVID C. LEA
Research & Development Mgr., Olin Mathieson Chemical, Forest Prod. Div., West Monroe, La.

A. J. LOEB
President, Ecusta Paper Div., Olin Mathieson Chemical Corp., Pisgah Forest, N. C.

A. T. LUEY
Executive Secretary, Boxboard Research & Development Assn., Kalamazoo, Mich.

DONALD MACAULAY
President, Paper & Printing Quality Div., Paper Quality Control Inc., Chappaqua, N. Y.

tention to what the customer really wants have been the most noteworthy.

"If one were to single out the most important aspect, I believe uniformity would be selected."

Speaking out against one of the primary hindrances encountered in quality control, a member of the PULP & PAPER panel had this to say: "Quality control's greatest problem is to gain the active support of top management. Top management will not (as a rule) take the necessary few minutes a week to show an active interest in the program. If it is to succeed, every level of management must know that the vice president for operations is interested and active in the program. Every man is interested in what his immediate supervisor is interested in. When the top man isn't interested, neither are those in lesser positions. Such a condition causes the program to wither from the top down."

An Aim: Less Quality

Oddly perhops, the aim of quality control in some instances is LESS QUALITY. A panel member explains it this way: "While a quality control program would be normally expected to produce a higher quality product, the cases where this is not true should not be overlooked. Many times, on the average, more quality is given to a customer than the price and end-use demand. This in order that the customer receives only a minimum of product below the acceptable standard. Quality control can earn some of the profit dollars to justify its existence by lowering the average quality produced and hence the while at the same time keeping the minimum quality at an acceptable level."

"when the top man isn't interested, neither are those in lesser positions"

Putting Teeth into Quality Control

To be effective, quality control must be strictly enforced at all levels of management. Nearly every panel member agreed. "Top management should be sold on the idea in a practical way," one member said, "and see that the department responsible for carrying out the program is properly fitted into the company's organizational set-up to give it the greatest possible effectiveness."

"We put teeth into our quality control program by placing responsibility for quality squarely on the shoulders of those who make the product. Production records are kept in such a way that any off-quality product can be traced back to the individual who produced it. Thus individual is made to feel a personal responsibility for quality."

Impartial Decisions

That quality control must be placed on an even footing with production was an almost unanimous decision of the PULP & PAPER panel. "The manager must settle all differences of opinion on quality questions very impartially," one panelist declared. "On this basis the production departments will respect quality control personnel so that they can fulfill their responsibilities."

That responsibility for quality extends through all levels of mill personnel was stressed by a panel member from the South. "Operating personnel should be expected to produce quality products," he declared, "and held just as accountable for producing products within the quality control standards set up by management as they are for meeting production goals. Their ability to do this should have a direct bearing on advancement and salary adjustments."

R. G. MISPLEY
Assistant Manager, Industrial Grades, Crown Zellerbach Corp., San Francisco, Cal.

MALCOLM J. OTIS
Resident Manager, Crown Zellerbach Corp., West Linn, Ore.

T. A. PASCOE
Manager, Research Department, Nekoosa-Edwards Paper Co., Port Edwards, Wis.

T. RICHARD PROBST
President, Deerfield Glassine Co. Inc., Monroe Bridge, Mass.

S. J. ROBINSON
Vice President & General Manager, Publishers' Paper Co., Oregon City, Ore.

B. E. SOOY
Production Manager, Wolverine Carton Co., Rapids, Mich.

E. E. STEPHENSON
Director, Quality Department, Sutherland Paper Co., Kalamazoo, Mich.

R. W. K. ULM
Mill Manager, Fiberboard Paper Products Corp., Antioch, Cal.

MILTON YEZEK
Manager, Research & Quality Control, Carton & Foods Corp., Battle Creek, Mich.

(PHOTOGRAPH NOT AVAILABLE)

D. L. DYE
Director of Product Standards, Scott Paper Co., Chester, Pa.

QUALITY CONTROL

Good Control with Reasonable Profit

A good rule for quality control; Use as little as possible, but make it effective. Good control, agree many of the panelists, can be achieved with a cost of approximately 0.5% of the sales dollar—if it is administered properly and followed through.

Justifying quality control on a cost basis or any other basis was discussed by most of the panel members. "Sufficient control," said one, "is justified to insure that products shipped to a customer meet that customer's requirements. No more, no less can be justified. . . . What is indicated is a middle course, where on the one hand the customer's requirements are known, evaluated and met; where on the other costs and methods for achieving the necessary standards are of such a nature that the seller can meet them and still achieve a reasonable profit in the process."

Improving the Profit Picture

Commenting on the cost question, a Southern research manager ranks the question of profitability above all others. If quality control does not produce on the average a better and more uniform product; if it does not result in a more salable product with fewer complaints and fewer rejections; if it does not reduce waste or in some manner improve the profit picture of the operating unit—then it cannot be justified.

"One necessary prerequisite for a modern quality control program is suitable specifications and standards for the products produced. While every mill operator would assure you that these do exist, it is a fact that very few pulp and paper mills have any formalized specifications and standards program."

A Pacific Northwest research director points to six cost reductions that will result from good quality control.

(1) Fewer customer claims and rejections; (2) lower inspection costs in the finishing room; (3) less waste because of more prompt awareness of defective or substandard paper; (4) less mixing of good and off-quality paper; (5) less downtime in finishing and converting operations, and (6) prompt rejection of off-quality paper, thereby making it possible to remake the paper before changing grades on the machine.

Cost vs. Savings

Another West Coaster brings up the matter of savings. "While it is not difficult to determine how much your quality control program is costing you," he says, "it is usually quite difficult to determine how much it is saving you. A good program, of course, will pay its way many times over, but it may be hard to prove it with figures acceptable to the accounting department."

"A question of economics" is the way another panelist comments on the justifiability of quality control. "It (control) should be installed to the extent that is necessary to produce a product that will meet minimum standards. The money spent on quality control must be passed on in the price of the product; so, actually it is the customer who makes the determination."

One Most Important Aspect? Disagreement

In answer to PULP & PAPER's query, "What, if any, is the one most important aspect of quality control?" Every one of the panel members agreed to disagree. Not too sharply, perhaps, but each came up with an individual answer that demonstrates the relative newness of this field.

"Fixing responsibilty is the one most important aspect," said one. Another: "For top management to establish a quality control philosophy and be willing to make it a separate and unique function."

"Keep it simple" was the view of a Midwestern researcher, while "management acceptance and belief" was the thought of another panelist.

Among the other views: (1) creation of a quality atmosphere; (2) cooperation; (3) education; (4) the acceptance of quality control's importance and the realistic implementation of its requirements by management and all levels of supervision, and (5) complete specification.

Underlying all answers, though, seemed to be the cooperation of all those involved. As one Westerner put it: "If the supervisors of the manufacturing departments and the paper machine crews do not work wholeheartedly with the quality control department, then the effectiveness of quality control can be reduced to the point that it would be better to be without such a department. We have found to our disappointment that many supervisors and hourly employes are anxious to pass along their quality responsibilities to anyone that will take them on."

"Quality control," said one panelist, "must be an action of positive service, not one of negative policing."

Proper Definition

Quality control cannot be effective unless there is first proper definition of what is being sought. This involves, according to one Blue Ribbonist:

(1) Selection of the properties to be tested; (2) test methods; (3) quality level; (4) tolerances, and (5) acceptable quality level.

'With these specifications spelled out," he says, "quality control becomes a relatively simple matter. Without such specifications, quality control is flying blind. Unfortunately, few companies provide complete specification."

Importance of Organization

Obviously, any mill establishing a quality control department must know specifically just what will be expected from it. Quality control must be more than a name on an office door.

Any quality system must serve two masters: the mill and the customer. It must be set up with this in mind. As a Western manager described it:

"A quality control system must be set up along the following organizational lines—manager, chief of quality control and inspectors or testers.

"A set of written specifications with rejection limits is set up. The rejection limits are established from knowledge obtained from the customer and are based on use requirements. The rejection limits against which the testers compare test results are somewhat tighter than necessary for trouble-free use by the customer. The chief of quality control may change any rejection limit at any time, but a record of the reason for change must be kept."

Underlined in Red

From the East Coast come these suggestions: "The quality control system starts with a standards book in which each grade is listed by name

"very few pulp and paper mills have any formalized specifications and standards program"

and code number. On each grade sheet is given the furnish for the grade and a list of the various weights in which it is made. Specifications for each weight are listed, and these values are set by experience as the average condition for the grade. Certain specifications are underlined in red in this book, and this is intended to indicate that these are very critical requirements and must be met. All grades list test values for weight, caliper, tear, mullen, porosity, sizing and ash content. In addition, such tests as wax lift, fiber bond, fold, tensile, finish, wet strength, stiffness, etc. are listed for certain grades where these tests are required.

"Samples from each reel of paper off the machines are forwarded to the laboratory as fast as they are produced. On certain grades each reel sample is given complete test while on others every other reel may be sufficient; or only certain specific tests might be run on each reel with full tests on alternate reels.

"In addition to the physical tests, the samples are examined visually for finish, formation, color, surface properties and for any defects such as dirt, lumps, streaks, marks or other defect.

"Changes in furnish and specifications are made frequently and this is done by issuing new standard sheets from the technical department. . . . Our whole aim in this quality control procedure is to provide our customers with paper that will perform satisfactorily in their operations, and to make that paper as uniform as we can with the greatest degree of efficiency and the lowest possible cost."

"quality control should not be measured against a customer requirement but against a standard performance"

A Stated Reliability

Certainly quality control has one specific purpose: to insure certain standards and thus assure customer satisfaction. In answer to PULP & PAPER's question, "What is quality control supposed to do for you?" a Midwestern executive declared, "Control can, if properly handled, insure an accurate balance between production cost and required quality. This makes two things possible: the assurance of minimum cost and the maximum acceptibility by the consumer consistent with what he can and will pay."

"Statistical methods," said another panelist, allow frequent reports to management because numerical values, having a stated reliability, can be used."

Succinctly phrased by a Pacific Northwest mill man: "Quality control gives management the assurance that the product being shipped to the customer is of uniform quality, that it has been made to certain definite specifications, and that the cost of producing it has been kept within established limits."

The Customer's Role in Quality Control

That few firms maintain good record files was pointed up by one panelist as reason for the danger in evaluating quality control by complaint records. "These files," he said, "are loaded with opinions, not facts." Further, the file varies in size based on market conditions. In other words, much bad quality is accepted during periods of shortage.

"Therefore," he concludes, "the only true evaluation is to set company specifications and to evaluate against those specifications the percentage of good and bad quality manufactured; and that record—good or bad—is realistic provided that it has been set up efficiently."

Complaints and claims, says a mill manager, are evaluated in the light of the following questions: (1) Should the system have detected this board at the time of production? (2) Why was the off-quality board not detected? (3) How can the system be modified to detect such board in the future? and (4) if there are few complaints, is it too expensive to maintain the current quality level?

Cost Important in Evaluation

A Midwestern research manager looks at the cost angle. Evaluation of the program, he says, must be based on the following factors:

(1) Salable product saved from downgrading or reworking.

(2) Production and engineering personnel time saved that formerly was spent on fruitless attempts to eliminate nonassignable causes; and the elimination of assignable causes.

(3) Resultant increased production per machine of salable product.

(4) Decrease in customer complaints resulting in decreased credits and improved customer relations.

(5) Most systems result in raising the overall quality level at lower materials cost.

(6) Production labor is reduced as a result of the proper functioning of quality control.

"The final justification of any quality control program," one panelist declared, "should be based on the financial savings to the company after consideration of the cost of the program. A relatively few tons of rejected product are usually sufficient to illustrate the tremendous value of an adequate quality control program."

For the Director: Confusion

Quality control should *not* be measured against a customer requirement, but against a standard performance. This view was expressed by a panel member, who continued: "Only confusion can result if each mill inspector must remember what quality level each customer requires. All must measure against one common standard for a given quality characteristic; then individual customer needs can be established as some ratio to the standard."

The opposite view came from a Southern executive: "Quality control cannot really fulfill its obligations unless the standards by which it operates relate to customer requirements. Establishing these standards is a joint responsibility in our organization in which production, quality control, research and sales all participate."

Yet another problem in evaluation of the program is the fact that many customers do not know specifically what their needs are. As one Blue Ribbonist put it "Unfortunately, most customers don't know what they need. That means that we must establish our own internal specifications for the product. On the other hand, we encounter customers who 'over specify.' The product is better than what it needs to be to serve the purpose for which it is intended. In these areas the customer generally pays more for his product than would be necessary."

Analyzing Complaints

One of the most difficult aspects of quality control is the determination of what exactly the customer wants and/or needs.

Simply stated by a panelist, "Realistic consumer surveys are constantly carried on to determine the fine points of consumer preferences. Over the years a great deal of information has served to clearly delineate the balance and level of primary quality factors necessary for products to be adjudged superior. Continuing surveys serve to refine judgment and direction on basic consumer and industry trends, and also to bring to light unsatisfied consumer desires upon which research ef-

"a definite need is for on-machine instrumentation to give many test data now performed physically off the machine"

fort can be directed."

The historical method for assembling customer reaction, says a Midwestern executive, is "an analysis of those items and areas that are known to cause dissatisfaction as expressed by a customer in the terms of complaints and criticisms. To be used intelligently, this information must be analyzed thoroughly and interpreted with considerable thought concerning the economic realities imposed by process and equipment limitations."

A Long, Fragile Chain

The chief problem in this approach, he continues, is one of communication. The complaining customer is linked to the man responsible for production only by a long and fragile chain of communication. The chain includes salesmen, sales managers, sales service personnel, staff groups and the direct line of production supervision. Recommunication and re-interpretation of the original complaint may result in the situation where the "cure" may not even be related to the original problem. Complaint investigation and communication are vital functions of quality control.

Another reaction: "We try to determine what is actually needed to insure the performance of the paper consistent with what we are able to do and what we can afford to do. . . . A few enlightened customers provide us with lists of defects encountered in running our paper, and a careful analysis of such lists enables us to make necessary corrections."

Other Directions for QC and the Future

Possibilities for quality control's use in other than direct application seems to open a wide and in many cases uninvestigated field.

From the West Coast comes this suggestion: "We see its use in augmenting production by highlighting trends, by highlighting trouble sources, by helping to raise the overall quality level as a result of highlighting areas of superior quality. It can help form part of a good working atmosphere. It makes for better job security and protects stockholders' investments. The information developed from day to day in special testing can be put to good use by process control. By highlighting consumer reaction, it can often point the way for new products or product improvement. By setting quality controls for production and development, it can help research keep on the right consumer track."

Another aspect: "Quality control and its area of work can be used for in-plant generation of spirit of production-quality partnership."

"If you are talking statistical quality control," another panelist advises, "it is possible to use the same statistical methods to evaluate the yield, cost variations, waste and other characteristics of operations and processes."

Role of the Supplier

A definite need is for on-the-machine instrumentation to provide many of the test data now performed physically off the machine. This emphatic expression of necessity in the industry was expressed by an Eastern mill man, who continued:

"We feel that we are doing too much destructive testing, i.e. we must physically destroy the paper to get the tests we are after. . . . There are many obvious advantages to instruments that can test the moving web non-destructively. For control purposes, a continuous recording of the physical characteristics of the sheet would obviously be ideal. Individual tests taken from the reel cannot possibly be as good as a continuous test; and, of course, the continuous test can be used for quicker and more adequate control.

"Progress has been made in this direction as can be seen from the fact that basis weight can now be determined continuously with a Beta Ray gauge. Moisture content can be determined with any of a number of instruments. It should certainly be possible to develop instruments that would measure surface gloss, opacity, finish and possibly thickness as well."

High-Quality Trends

Following the historical development of manufacturing and service industries, "There is no doubt that high-quality trends are resulting in higher quality demands in the lower grade paper products." Improvement of existing products, which permits increased acceptance and use on the part of the consuming public, is the most important factor in the growth of any industry.

Uniformity enters the quality picture according to a Midwestern mill man. "Uniformity," he says, "is one of the most important aspects of quality in all current markets. There is in our experience a definite trend toward insisting on a much higher degree of uniformity in all lower-grade paper products. Moves to upgrade the basic ingredients of properties of the lower-grade products usually result either in the price cutting of the higher grades and selling under a low-grade category or in such a basic set of changes that one actually finds himself selling higher grade products at low-grade prices.

A Brief Look Ahead

"More of it" has been called the future trend in quality control by one of PULP & PAPER's panelists. "With consumers demanding better quality from year to year," he says, "the only answer is more and better quality control. The trend will be in the direction of electronic controls that will automatically adjust production equipment so that a uniform product will emerge. Some automatic controls of this nature have been made available to the paper industry only recently but are not yet developed to a satisfactory state. We still depend very largely on manual adjustments based on test samples drawn periodically from the production line. The time lag was bad enough 20 years ago, but today's high-speed production makes any time lag unacceptable from a quality control standpoint."

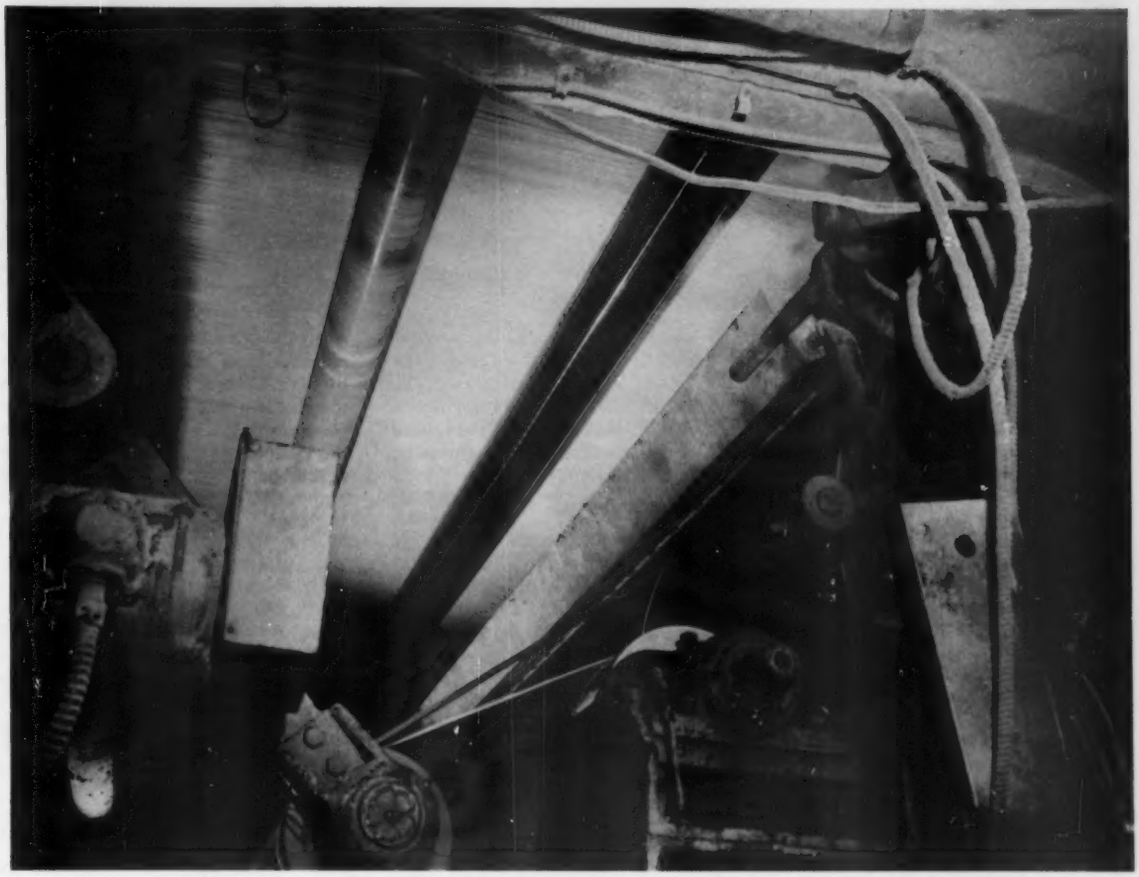
A prediction is made by a Southern executive as to the future of quality control: "Statistical analysis and automation both in testing procedures and process control."

"The most serious attitude regarding quality control," concludes a control expert, "is the assumption that it can put out fires and is therefore a post-operative investigating function. Properly operating, it is not an area partitioned off behind a sign 'Quality Control' with an elaborate collection of instruments unused except to study the causes of the complaint. This is common and is the type of quality control that should be discarded. Control as such should be eliminated. But, quality assurances and quality uniformity should be equally important goals. An in-coming, in-process, out-going fact-finding group must be established to intelligently relay and communicate information to line operators for greater uniformity and greater customer satisfaction."

END

HOW TO DO IT

How Teflon Tape Reduces Clay Buildup



NO BUILDUP PROBLEM on overhead carrying roll at right at the Badger Paper Co. Mills, Inc., Peshtigo, Wis. Roll once required considerable cleaning and scraping due to buildup from clay sizing in the paper web. Since it was spiral wrapped with Teflon tape, it has been in constant use without buildup problem. The Badger company reports that running conditions have never been better. Cleanup time has been almost eliminated and they say the tape has more than repaid itself from increased machine efficiency. The tape, introduced by Minnesota Mining and Manufacturing Co., St. Paul, Minn., has excellent chemical stability over a wide temperature range. Because of the easy release property of Teflon, few known compounds will adhere to it with any permanence.

BEST METHOD OF APPLYING Teflon tape is to have two men do the job. One holds the tape on a metal or wood pin and keeps a high tension on the tape. The other guides the tape onto the roll maintaining a ⅛-in. to ¼-in. overlap as the tape is wound. Here, the roll is mounted on a lathe.

TOP MANAGERS OF MILL GREET THE EDITOR at the Communar Mill, south of Leningrad. A very warm welcome, especially from the managing director, ALEXEI TROFEMOV (at far right) was extended to the editor ALBERT W. WILSON (center, right). Head of the mill's experimental and developmental laboratories is CZENIA KARPOVA (at left). Chief engineer is CONSTANTIN MASLINIKOV (center, left). All three accompanied the editor at all times as he visited every department as well as a recreation hall nerby.

BENJAMIN SUMM, chief mechanical engineer and scientific secretary at Russia's Central Pulp and Paper Research Institute in Leningrad, accompanied the editor on the trip to the Communar mill. Mr. Summ, born in Latvia, was a school-mate of Mill Manager Trofemov.

Inside a Russian Mill

Six machine plant near Leningrad makes "cleanest paper" in the Soviet Union, with 55% of its staff comprised of women workers

By ALBERT W. WILSON
Editor, PULP & PAPER and PULP & PAPER INTERNATIONAL

● The giant jet plane made it from Moscow to Leningrad in just less than one hour. The hostesses in Russian jets are not picked for their beauty but these were friendly girls, younger than you see on other planes, and from their large serving room, blocking off the pilots' section, they came through the plane time after time—first with candy; then, apples; then, sweet cakes, etc. The passengers —probably 100—sat in groups of four at serving tables, half facing forward, half facing toward the back of the plane.

Across from me was a friendly, worldly-wise military officer and a pudgy blond, worried man about 40. Alongside me was a very thin young man. Without disturbing him, I could not get out in the aisle to look at the recording instrument in the passenger section, high up on the forward wall, which was attracting so much attention. During the flight many passengers came forward to look at it. I decided it probably showed speed or altitude or both. No one near me spoke anything but Russian, I soon discovered, but we passed the time glancing through magazines we found on our table.

The plane was halted on the field so far from the Leningrad airport terminal building, that we all had to board small buses. The buses waited a long time before moving and at the terminal, to my chagrin, I found the long wait was because they were looking for me. I had just quietly taken a seat in one bus, and no one apparently suspected I was their special guest.

Trip to the Paper Mill

Leningrad, with its French-style palaces and chateaus, the Neva River and canals, is reputedly Russia's most attractive city, but my old hotel, with my ancient room and heavy red drapes around an old bedstead, was a far cry from the new and gigantic Ukrania hotel where I stayed in Moscow—Europe's biggest hotel.

After a morning at the Central Pulp & Paper Research Institute (more reports on this later; also discussed in the July issue report on Russia), I was given 45 minutes to have lunch alone at the hotel, and to be ready to drive to a Russian paper mill, 21½ miles (36 kilometers) south of Leningrad. I rode with Benjamin Summ, the Latvian-born scientific secretary and mechanical engineer from the Institute, and in the front seat was our interpreter, Lucy, sitting alongside the driver. I spoke some German with Mr. Summ, but Lucy, a rather pale, but beautiful girl with her black hair in old-fashioned curls, was so solicitous—eager to translate every word either of us said —that most of the conversation was English to Russian and Russsian to English. Later in the mill, she industriously and eagerly translated every word she could. But some mechanical or technical terms were too much for her, and she was relieved when I told her I knew what the machines were, without her telling me.

Just before leaving the outskirts of Leningrad, they asked me what my plans were for the evening. When I said none, they enthusiastically recommended the Leningrad Ballet—No. 2

in Russia—and so there was nothing to do but stop the car so Lucy could go to a small sidewalk phone booth to reserve tickets and she agreed to go with me, "if I can be of help (by translating)."

The road to the south was fairly smooth until we came to a very rough ten-mile stretch where repair work was being done. But we took the same road back; we would have had to travel many more miles to find an alternate route, so we really had no choice. Much of the land we passed was undeveloped. Fortunately, because of the dust, we passed very few cars. There were small areas of forests, but not many trees. It is flat country. The small villages we passed through were old, poor and backward—just as in some other European sections.

But we were due for one surprise. It was Pushkin-town. In contrast, this was a brighter, prettier town. Here was the Lyceum where the famous poet, Pushkin, studied. And soon we saw another reason for the town's different appearance. We came upon a summer palace of Empress Catherine and the Czars. The grounds around it were wooded, with streams, and many little hillocks. The story is that Catherine, tiring of the flat, uninteresting scenery, ordered that trees be planted, streams and hills be formed—all in one night. The job had to be finished before she woke in the morning! (One soon learns that a repeated theme of Communist propaganda is to recall the brutalities of the czars—museums are dedicated to showing their ill-begotten gold and jewels and the wealth they created at expense of the serfs.)

The Communar Mill

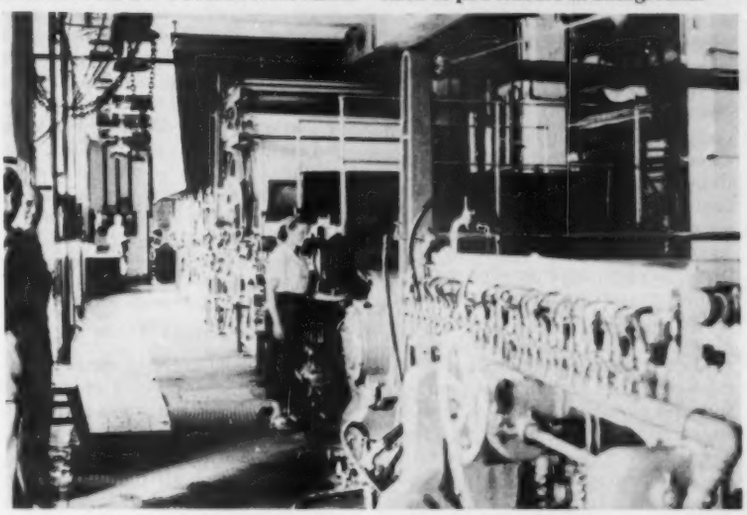
Now we passed over small hills and on one is a new Astronomical Laboratory. The next town was Pavlovsk, and then just a few miles further, Antropshino.

Here is the Communar Paper Mill, reconstructed after the war. Also called the Thin Considator Milll, it houses six machines making electrical insulation and condenser papers.

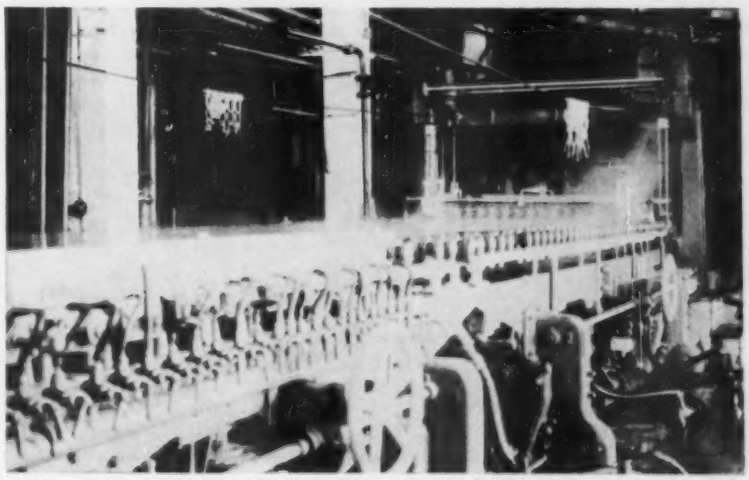
Toward the end of the war, the German armies marched into this territory. There were then four machines. These and other equipment were carried off to East Germany. But before they could be started up, the war was over. The Russians brought machines and equipment right back to the village of Antropshino. So, it was a complete reconstruction job which had to be done here.

Two more machines were built in Leningrad in 1951 to make "the cleanest papers." I did not learn where the first four were built and they had no identifying marks that I observed. All

ENTRANCE TO COMMUNAR MILL—stack of powerhouse in background.



GIRL MACHINETENDER is one of many who run machines in Communar mill. This is one of six Fourdriniers making condenser and electrical papers.



ANOTHER VIEW OF CONDENSER PAPER MACHINE. At the time this machine was making paper 12 microns thick, but the manager said it could make it as thin as 5 or 6 microns.

RUSSIAN MILL . . . rewards for workers . . . good housekeeping

six machines are the same size—each is a Fourdrinier, 1816 millimeters wide. Every machine is in excellent repair, everyone with its framework painted green. The painting was done fairly recently and one machine loooked as new as the other.

Manager and Aides Extend Welcome

Mr. Summ, Lucy and myself were first greeted in the main office by the slim, friendly manager, Alexei Trofemov. He immediately called in Chief Engineer Constantin Maslinikov and an attractive middle-aged woman, Czenia Karpova, head of the developmental and experimental laboratories. I was soon to learn more women are in key positions here—even to operating machines—than men. Of the 700 employes, 55% are women. Of the engineers and technicians, 70% are women.

Mr. Maslinikov and Madam Karpova, as well as Mr. Trofemov, accompanied us throughout the tour. All three went everywhere with us—through mills, power plant, recreation center, etc. I had already noticed that wherever I visited Russian offices, research centers, etc., there always were two, three or more persons greeting and accompanying me at all times.

These hosts were friendly, especially Manager Trofemov, who did all the talking for them. He immediately told me I could see anything I wished, ask any questions and they would be answered, and take all the pictures I desired. He gave me some pictures, too. Mr. Trofemov was a man of good humor, and liked to make a friendly joke, and he was obviously warmly attached to many workers, and proudly introduced several to me.

He and Mr. Summ were old schoolmates—they had attended together the Technological Pulp and Paper High School of Leningrad (on college level, as are the Hochschules in Germany). This school, only 20 years old, has trained many specialists for this industry in Russia. There is also in Leningrad, the 151-year-old Forestry Academy, with about 3000 students in forestry, pulp, paper, lumber and similar studies. The High School of Mr. Summ and Mr. Trofemov awards a degree of diplomat-engineeer.

Makes "Thinnest Paper" in Russia

They told me the Communar Mill makes "the thinnest paper in all of Russia." When I was there, it made paper of about 150 kilograms basis weight, down to a thickness of 12 microns. They were producing about one ton a shift, but of course this grade of paper does not reach high tonnages in any mill. The Russian mill operates night and day, seven days a week. "Every year more of this paper is needed," they said.

The cellulose is delivered here from pulp mills in the Leningrad area, some in the far north in Arctic regions. Bleached sulfite woodpulp is used for technical papers, being made on two machines. Sulfate or kraft pulp is used on four machines for condenser paper. Coal is burned in the power plant.

Profits and Wages

"Our annual profit is about 25 million roubles," said Mr. Trofemov. Of course, in Russia the profits are for the state.

Communar Mill belongs to an association in which all the mills in the Leningrad district are affiliated. There are 24 mills in this district and their representatives serve on a Central Council, where all matters of common interest are settled. The funds for operating the mills and for new projects are received from the Gosplan (The State Planning Commission, in Moscow, whose six top engineers for pulp and paper had been interviewed by me a few days before).

Wages of the average employe in in Communar Mill are 900 to 1000 roubles per month. It is difficult to establish the true value of such wages. Tourists coming to Russia receive 10 roubles to one U.S.A. dollar or 28 to a British pound.

Incentive Pay for Russians

Incentive systems and payments are common in all Russian industries. I was told some workers in the Communar Mill can make up to 2000 roubles a month. A good worker can make twice as much on the same job as a poorer one. How can this be measured in a machine room, or for a machine crew? I was told "it all depends on the productiveness of the worker as to what he can earn."

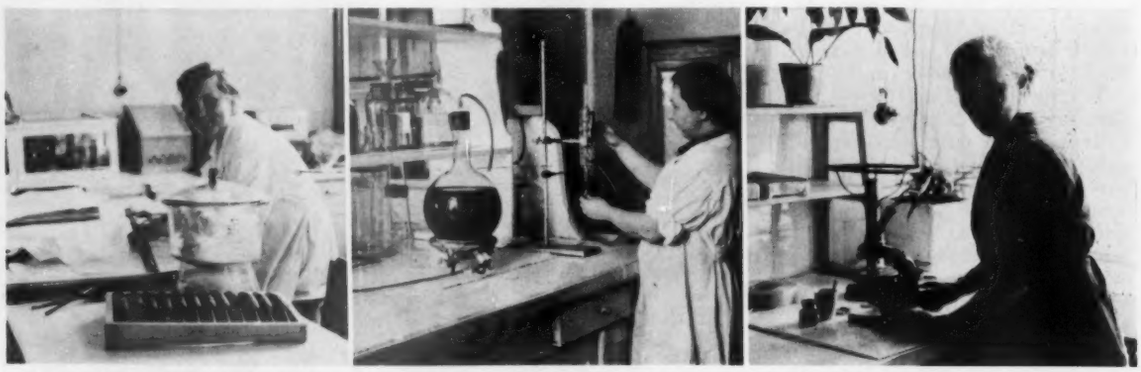
Percentage figures are posted prominently to show how each crew is fulfilling its own plan and the mill plan.

But this isn't the only way workers are rewarded. Their pictures go on a signboard at the mill entrance gate, where all can see who are the best workers. This board was proudly shown to me by Mr. Trofemov. I recalled I had seen a similar display of pictures at the Pulp & Paper Institute—these were the honor students.

I noted that several workers he singled out in the mill, to be introduced to me, were "star" workers, too. He heaped much praise on one light-haired young man, who seemed accustomed to such attention.

Women in Key Positions

Many of the best workers are women. I was introduced to one husky, blond woman, intelligent and quite handsome, and I was told she



THREE VIEWS IN LABORATORIES OF COMMUNAR MILL. Notice the old-fashioned abacus in front of pretty girl working over engineering drawings. We didn't find out what the big shiny pot is used for, shown in same picture. In other views, a woman is using a microscope in one case, and in the other, working with a test tube.

was superintendent in charge of all the paper machines. Others I met were in charge of individual machines and some, of course, had men or boys working under them. I found women working on supercalenders, on rewinders, etc.

I was shown laboratory equipment, all of which appeared to be standard equipment, such as many mills have in other countries. The control laboratory is also headed by a woman, as well as the experimental laboratory. Twenty persons are employed in technical control work.

I was told that the experimental laboratory headed by Czenia Karpova is "producing new sorts of paper" as well as improving the condenser papers. Two of the machines were making technical papers.

Why do so many Russian women do what other countries consider as men's work? Obviously, the heavy war casualties suffered by Russia is a major reason. For the same reason, many women do men's work in Germany, too, but not many are found in paper mills.

"Women are more attentive than men, and can do some of the work much better," explained my host.

There are 70 engineers and technicians in this mill, and of this number, 70% are women. Many workers with so-called secondary educations still must work as common laborers. Many workers study by correspondence. Others are given compulsory education in the evenings or after-work hours.

German Equipment in Use

I saw very little equipment bearing foreign names or labels. Two of three rewinders I saw were made by Goebels plant in Darmstadt, West Germany. I also saw several Siemens motors from Germany, some as machine drives. Old-fashioned koller-gang machines are used, but these may be seen in many countries, and often are preferred for preparation of stock for finer quality papers. Beaters are also in use at this Communar Mill. Its two supercalenders were built in Leningrad. Each is 1860 millimeters wide. Each has 12 rolls.

I was told that a moisture-content measuring device used here was designed by one of the workers and built in the Communar Mill shops.

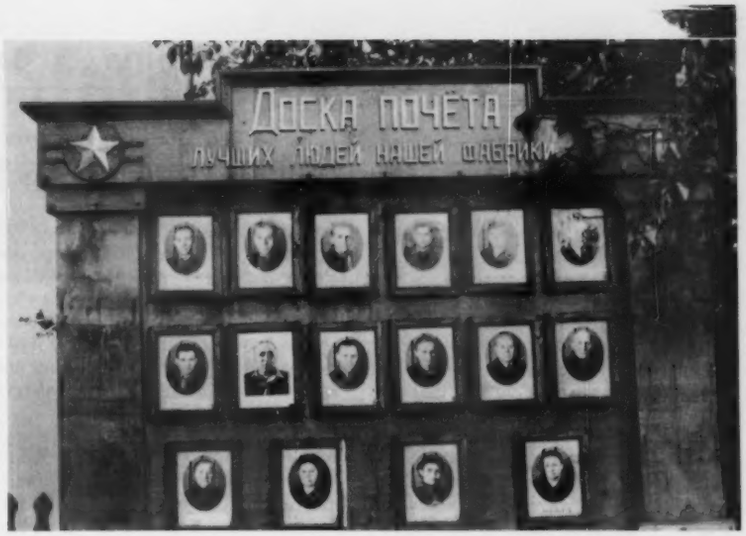
Cleanliness in Communar Mill

The mill appeared very clean throughout, and free of dust. There is no question but that it rates a high mark for good housekeeping and cleanliness.

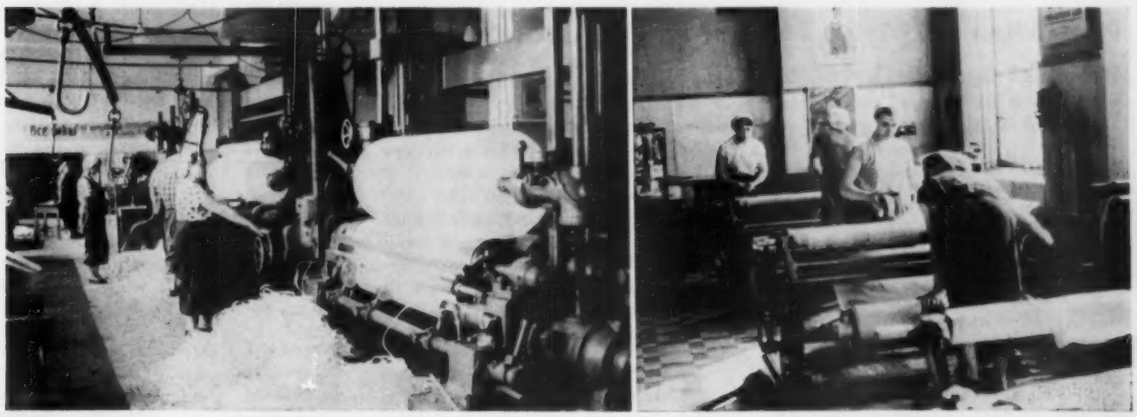
A quartz glass 6-inch pipe was used "for clean pulp," I was told. The river water is filtered in sand and then chemically cleaned by an automatic process. For every ton of production, 600 cubic meters of water is processed.

For each product of this mill, I was told that "17 analyses are made."

There is no doubt that this is a well-run mill with a staff at top dedicated to making it one of the best in Russia. I am sure that I was invited to this particular mill because it is one of the finest in the country. By the same token, in any other country, a visitor would probably be shown only the



ROLL OF HONOR FOR MILL'S BEST WORKERS. Six of the 14 workers shown here are women. Not only do the best workers in a Russian mill have their pictures posted, as shown here, but they can earn more than 2000 roubles a month, more than twice what another worker would get on the same job. This board stands at the entrance to the mill, where everyone coming and going sees who are the honored comrades. The heading at the top of the sign says: "Board of Distinction—Best People of our Factory."



MORE WOMEN WORKERS. At left all workers on the winders are women. Two of these winders in the Communar Mill were built by Maschinenfabrik Goebel GmbH, of Darmstadt, West Germany. At right, another group of all-women workers in finishing department.

RUSSIAN MILL . . . ties with China . . . expansion plans

best mills. Russia needed technical and condenser papers long before the new emphasis on more consumer goods, so it is reasonable to assume this mill may be more advanced than many others.

Close Ties with China

The staff here corresponds frequently with mills in Czechoslovakia, East Germany and China, I was told. The mills of those countries, making similar papers, exchange technical information.

Some of the staff from Communar Mill went to China to help their allies in that country to make condenser paper. They said the machines were brought to China and the Russians helped to restore them and put them in operation. Later, a delegation from the Chinese mill came to the Communar Mill to express appreciation and thanks. It brought many presents —Chinese theatrical masks, tapestries, Chinese swords and other lavish and valuable presents. Now there is an entire "Chinese room" at the Communar Mill which houses these presents. On all four walls are hung the pictures, tapestries and in wall cases are rich costumes and ancient Chinese regalias. There are pictures of Chinese and Russian papermakers together.

I was shown this room and told it is dedicated to better friendship and closer ties between the two nations. The staff was proud to show it to me, and workers were welcome to come and look over the exhibits at all times.

Near the mill is an auditorium and recreation building for the workers, also.

About Other Russian Mills

This is the only condenser paper mill in the Leningrad area. But only two kilometers from this mill is a plant making cartons to box television sets and other paper packaging products. It uses waste paper and also virgin pulp from cellulose mills.

Within the city of Leningrad of nearly 3,000,000 people, is a two-machine newsprint mill, but this I wasn't shown. Actuallly there would have been little time for it. I was told the machines are running at speeds of 300 meters per minute.

There were also reports that in the industrial city of Gorki, about 400 miles from Moscow, two big Bagley & Sewall (U.S.A.) newsprint machines, delivered before the war, are running at much faster speeds, comparable to the fastest newsprint machines in Canada and U.S.A. I was invited to Gorki, but cancelled those plans when I was told the mill was shut down for repairs.

Three machines are being built for Russia in Sweden, two in France, another in Finland, and reportedly others will be built in other mid-European plants.

But Russia is itself planning to build paper making machinery of all kinds at a huge central works to be established near Izhevsk, in the Ural Mountains region. This will be close to where most of the new mills are to be built under the Seven Year Plan which is now just under way. This machinery will not be exported, I was told, as it will all be needed in Russia. The 1960 goal of this Seven-Year Plan is 4,400,000 short tons of annual paper and paperboard production, which compares with 3,252,370 short tons in 1958 and only 1,350,800 in 1947.

Expansion Now Under Way

A start has been made on construction of 12 new mills, and more will be initiated in each successive year of the Plan. Two big machines to make coated publishing paper by the Peter Massey process are to start up late this year. Others to make bleached board for food packaging are being built. The Russian engineers readily admitted to me that they have a long way to go to catch up in paper with many of their neighboring countries or to bring up the consumption of paper for its 209,000,000 people to anywhere near comparable figures. But they are dedicated to this goal.

Presently Russia has 300 paper mills, many of them small. It has 50 cellulose mills, many small and antiquated. They are building digesters in Russia and they said they will require many more than the 12 big digesters now being delivered by KMW of Karlstad, Sweden. These are all for acid sulfite, but others will be built for kraft and semi-chemical pulps.

Russia went ahead of West Germany as a papermaking country in this past year and now ranks as fifth biggest producer in the world, after U.S.A., Canada, Great Britain and Japan. Last year Britain made 3½ million short tons of paper and paperboard. Japan, Russia and West Germany were each close to the 3¼ million mark. But Britain and West Germany each has only one-quarter of the population of Russia; Japan has a little less than half.

"We are going to catch up in per capita consumption, and it won't be many years from now," said a Russian research scientist in pulp and paper.

GIPROBUM—Has Final Word in Russian Purchases . . .

ГИПРОБУМ

Проспект Огородникова 58

Ленинград

С С С Р

GIPROBUM

Prospekt Ogorodnikova 58

L e n i n g r a d

U S S R

Here is the Giprobum address, where all pulp and paper equipment purchases are decided, in Russian and in Western characters. Chief Manager Sarin and Chief Engineer Svetloff head this agency, which takes over the long term plan made by the Pulp and Paper Division of the Gosplan (State Planning Commission) and the budget allowed by the Parliament and then draws up the program of purchases for the immediate year ahead.

U. S. A.: Official Data on Market Pulp

Washington, D. C. . . . Revised and final annual figures for 1958 for consumption of paper-grade market pulp at U. S. A. paper and board mills have been issued by the Bureau of the Census. Annual totals for each grade are shown below, together with Dec. 31, 1958 grade inventories:

	Year 1958 Consumption Short tons	Dec. 31, 1958 Inventories Short tons
Purchased Pulp	2,577,489	339,140
Bl. Sulfite	698,117	85,399
Bl. Sulfate	972,035	125,853
Unbl. Sulfite	231,955	36,669
Unbl. Kraft	331,620	59,380
Soda and Other	343,762	41,839

Safety Is a State of Mind

"To achieve this state of mind, people must hear what we say, accept what we say and agree with us."

BY REX PAXTON
Director, Public Relations, Sutherland Paper Co.
(Delivered at the National Safety Congress)

In public relations we try to produce a state of mind for a product, an idea or a person. In the case of safety it's an idea. When we accomplish this the result is agreement and acceptance of our safety programs. When our ideas are accepted our publics are "with us." And when people are with you they follow you because they understand and believe that their best interests are safe with you.

Someday in your own plant, you will go a full 365 days without a single disabling injury. This will occur when everyone in your employ lives up to what we know will create this ideal situation. This will happen when we get our people really safety-conditioned.

State of Mind is Changing

There's positive proof in the steel mills, which have done a magnificent job. In the early days, injury and death rates were appalling until Stewart Holbrook wrote that the best location for an undertaker's establishment was near the exit of the steel mill properties in Gary, Ind. The steel industry then took safety to heart and did something about it. Now, steel enjoys a rate of only 3.48. This is most convincing compared with other industries. The fluid milk plant for example is six times more dangerous than a steel mill.

In our safety programs we can never operate a "closed mind" shop—anything we do now can and will be improved. Our greatest need is new ideas for safety. Nothing is as powerful as an idea whose time has come. Safety-consciousness must be invested with sovereignty.

The airlines have taught us an impressive lesson in safety work. In the beginning their No. 1 problem was to overcome fear in passengers. Their job was to communicate safety. Fortunately, they recognized this was their No. 1 problem and they have solved it through the channel of communication.

Five Keys to Successful Safety Program:

1. Better communication
2. Team spirit
3. New ideas
4. Proper timing
5. Positive action from top management

"Get Through" to People

We are striving toward a vital goal influencing a state of mind—for safety. We accomplish this only as we "get through" to our people. It doesn't matter how good our safety programs are if people do not think they are good. Our job is to convince every individual in our employ that it is to his best interest to be careful, to think safety.

The time to duck an accident is before it happens. A good safety program goes to work before accidents happen. I don't know of a more effective highway safety sign for example than the one on the side of a police patrol car. The state of mind produced by the patrol car is one of caution and alertness that makes one think and act before an accident happens. He slows down his speed and becomes thoughtfully cautious. I believe the day is nearer than we think when public sentiment itself will be so powerful that accidents on the highways, in the homes, and in the factories, will grow less and less. I came to this conclusion when I read the Safety Council's prediction that the second million would be killed in traffic accidents in about 12 years at the present rate.

Most accidents are caused by preoccupation, wrong general attitudes, or ignorance of the basic safety rules.

Often a man's mind is not on what he is doing. He's preoccupied by home troubles or other things and becomes careless. We cannot go into the homes of every one of our employees and see that peace and tranquility prevails, but we can and must conceive new ways of changing the thinking of our careless employes.

Top management is the golden key to the whole safety structure. Oddly enough they often have been the most difficult to convince of the need for positive action in safety work.

REX PAXTON . . . "Communication is the most important factor in a safety program."

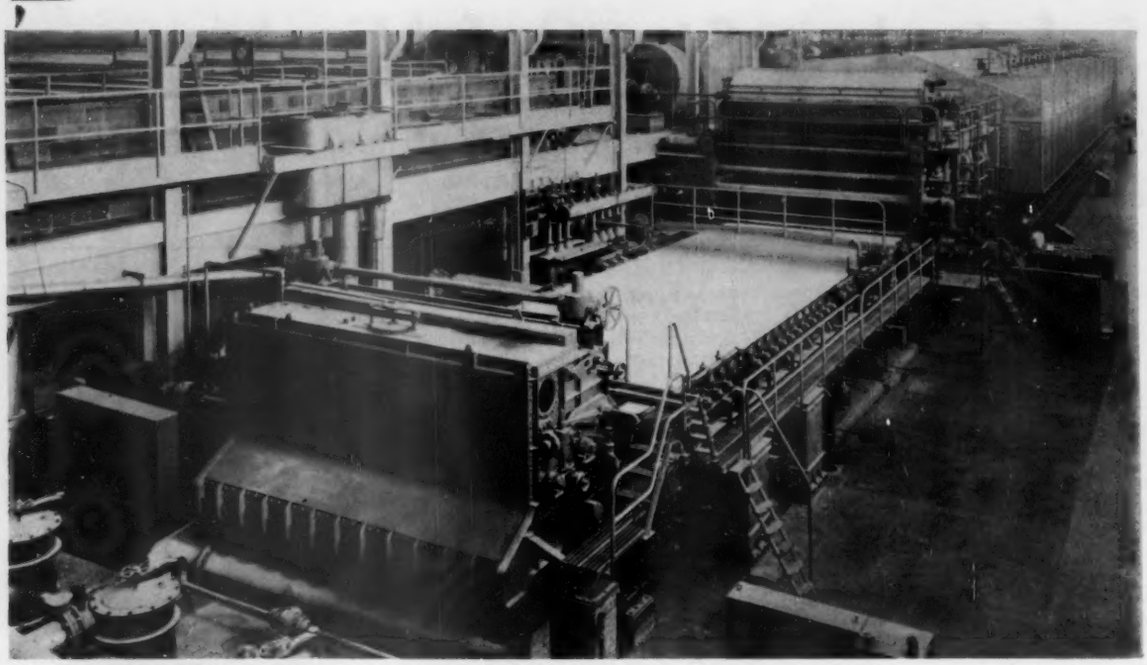
A New Day In Safety Is Dawning

Think of the miracles in engineering and construction field. The marvels of Univac and other ingenious creations of man stagger the imagination. These —and thousands of other reasons explain why we cannot be satisfied with safety standards, precautions and records that are outmoded. What is good enough today is not good enough for tomorrow.

Safety executives who really get things done know when they change the thinking, the attitude toward safety, they accomplish amazing results, like in the steel industry.

Here's proof that a new day in safety is dawning. The accident rate in 1957 was nearly 40% lower than the five year period of 1908-1912—or 60,000 fewer persons died in 1957 than would have been killed at the old rate in the period just mentioned

When we can, in our safety crusade create this philosophy, "do unto others as ye would that they should do unto you," we shall have reached that exalted state of mind when we think, not in terms of accident reduction, but in terms of no accidents at all.



ON THE LINE AT BRAINERD is this ultramodern Beloit Fourdrinier producing fine printing, writing and converting papers. The unit was formally dedicated in August at ceremonies to which the governor of Minnesota was invited.

"Most Modern Machine" Dedicated

. . . at Brainerd, Minn., where Northwest Paper Co. starts operation of No. 6, a 2,000-fpm Beloit Fourdrinier

—Brainerd, Minn.

● The Sky Blue Waters of Minnesota have welcomed a newcomer to their shores. Along the upper reaches of the Mississippi a thundering giant is making its presence known at the Brainerd mill of Northwest Paper Co.

Turning out fine papers at rates of up to 2,000 fpm, the giant was formally welcomed to the papermaking fraternity at ceremonies attended by industry leaders and representatives of government. It behaved as befits the "world's most modern paper machine".

The Beloit Iron Works unit is a 200-in. machine with a 182-in. trim width. Daily capacity of the 365-ft. Fourdrinier is approximately 150 tons. Grades produced embrace a wide range of high-quality printing, writing and converter type papers, supplementing those already produced at both the Brainerd and Cloquet mills.

Essential to the ultimate speeds for which the machine was designed are the pressure headbox, suction pick-up and transfer felt. Prime mover is a 1,650-hp Worthington turbine operating on 600-psi steam from the new boiler plant. Two in-line generators provide electric power for helper drives at the Fourdrinier, press and size press sections. Electric inching drives are provided for the dryer sections and the winder. A slack take-up drive is installed on calenders and reel.

The machine itself represents but 25% of the total cost of Northwest Paper's recently completed expansion program. Some 350,000 sq. ft. of floor space were required to contain the increased paper capacity and auxiliary facilities. The firm's own engineering and production staffs planned the project and effected the general plant design and much of the engineering.

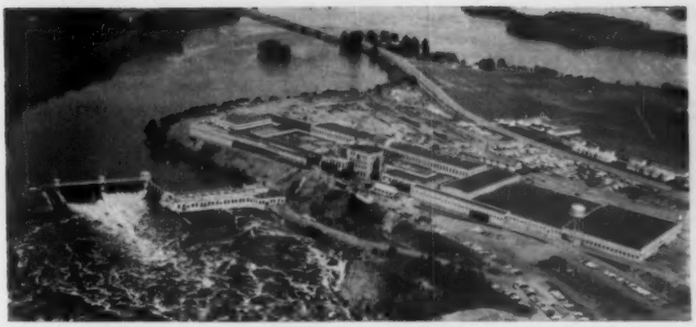
The spanking new Fourdrinier performed well for the visitors, turning out rolls weighing up to 12,000 lbs. each. Smooth operation demonstrated more than anything else the long and careful study that preceded actual construction.

The 200-in. by 130-ft. Fourdrinier wire is supported by 24 table rolls, the first six of which are grooved. Other components include a 32-in. dia. breast roll; seven stainless steel suction boxes; a 30-in. dia. electrically-driven dandy roll; a 36-in. dia. couch roll; two rolls, a wire tension roll and a wire guide roll, automatically controlled, and five wire return rolls.

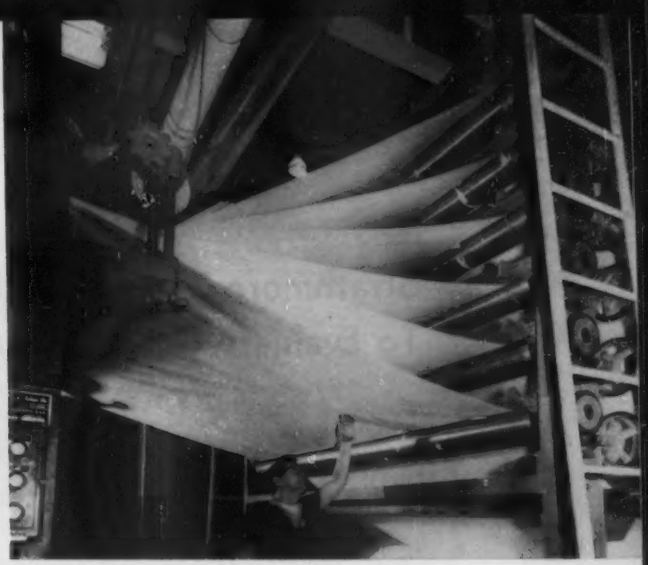
The press section comprises a suction-wringer press for the pick-up felt,

Harry T. Kendall Jr.
President

Mace Harris
Vice Pres.
Operations Mgr.



"WORLD'S MOST MODERN PAPER MACHINE" is claimed for No. 6 at the Brainerd, Minn. mill of Northwest Paper Co. This plant is located on the Mississippi River 100 miles north of Minneapolis-St. Paul.



FINE PAPER COMES FROM NO. 6 in rolls weighing up to 12,000 lbs. After inspection, rolls are wrapped or cut into sheets.

a conventional transfer press and first and second suction presses followed by a smoothing press. The 52 five-ft. dia. dryers and 10 five-ft. felt dryers are divided into three sections. The horizontal size press is located between the second and final dryer sections.

An automatic Ross-Midwest Fulton dryer drainage system ties in with Foxboro Dynalog moisture control. Removing vapors from the dryer section is a J. O. Ross aluminum hood of insulated and corrugated panels equipped with exhaust fans.

Each of the two open-face calender stacks has a 32-in. dia. king roll and seven 15-in. intermediate rolls. A heavy-duty constant-speed reel has a 36-in. drum and is capable of handling 54-in. dia. reels. The 6,000 fpm Cameron winder and slitter is equipped with roll ejectors, roll levelator and automatic shaft removal.

A beta ray weight gauge and controller supplied by Industrial Nucleonics scans the sheet, records the weight and automatically adjusts the stock metering valve to maintain weight within preset tolerances.

The need for conveyors and hand labor has been virtually eliminated in the recovery of broke with the installation of an E. D. Jones Liebeck system at the size press and stack sections and in the finishing room operations. An Impco shredder is located at the second press for couch pit repulping.

Pulp for the new machine (as well as for existing No. 5) is shipped to Brainerd from Northwest's Cloquet plant and is supplemented by purchased pulps.

In lap form, these pulps are proportioned as required and charged to a 20-ft. dia. Shartle Hydrapulper by means of a conveyor. After blending, the furnish—comprised of fibrous and non-fibrous materials—is refined with one Shartle No. 6 Hydrafiner and a No. 5 jordan. A DeZurik regulator controls consistency prior to discharge to the stock chest. The stock is given a final refining with three jordans (Shartle No. 5) before entering a second DeZurik regulator box.

Providing a constant volume of stock and white water to a battery of 11 Bauer Bros. cleaners is a 9,000-gpm Allis-Chalmers pump. Supplying stock to a Beloit pressure headbox (preceded by five Shartle Selectifier screens) is a Goulds variable-speed fan pump. The pump is powered with a 400-hp Electric Machinery motor.

Fiber and filler is reclaimed from the white water by a 2,000-gpm Sveen-Pedersen flotation saveall. The unit provides clarified water for reuse.

Precision metering equipment permits continuous addition of clay, retention agents, color and alum to the new machine.

Maximum use of mechanical equipment is made to minimize labor costs and insure a constant flow of paper through the finishing process to the shipping docks. Sheeting is handled by Clark-Aiken cutters (one 64-in., one 112-in. and one 118-in.). Hydraulic Seybold Auto Spacer trimmers (two 85-in. and one 100-in.) are augumented by lift tables, unstackers, air film tables, conveyors and air lances as well as straddle tables and spear stackers.

Shipping is both by truck and rail. So that a streamlined flow of paper is possible, shipper rolls are loaded adjacent to the machines, whereas sheet stock is stored for shipment and loaded in a building forward of the finishing area.

Leadership in the Brainerd expansion was taken by such men as Harry T. Kendall Jr., president; Mace V. Harris, vice pres. and mgr. of operations; Roy I. Nilsen, vice pres. and mgr. of manufacturing; B. W. McEachern, vice pres. and mgr. of sales, and Leo J. Gayou, res. mgr.

In 60 Years: Newsprint to Fine Papers

It was in the spring of 1898 that C. I. McNair Sr., R. D. Musser and Charles A. Weyerhaeuser journeyed to Cloquet, Minn., to discuss with R. M. Weyerhaeuser the possibility of constructing a paper mill. R. M. Weyerhaeuser was operating Northern Lumber Co. at the time.

The men, in company with several associates, agreed on the site of a newsprint mill. The company was organized that same year as Northwest Paper Co., a West Virginia corporation. It became a Minnesota corporation in 1910.

The mill as built in 1898-99 consisted of a groundwood pulp mill with 10 grinders and one paper machine with a daily capacity of 30 tons of newsprint. A second paper machine was installed in 1900 and additional groundwood capacity provided.

A groundwood mill was built at Brainerd in 1903. It remained in operation until 1911. In 1915 a sulfite pulp mill was constructed to eliminate purchase of chemical pulp. This made Northwest Paper an integrated mill.

With surplus sulfite capacity available, construction of additional paper production facilities at Brainerd was undertaken in 1915. First newsprint was produced in 1917.

During the early 1920s the Canadian competition in newsprint became more serious, and the firm turned to higher grades. In 1923 construction was underway on a sulfate pulp mill at Cloquet. With its completion in 1924, newsprint output was discontinued.

The Brainerd mill produced newsprint until 1935, when Canadian competition made it uneconomical to continue. Wallpaper was produced until 1956, when the machine was equipped for the manufacture of printing and fine paper grades.

In 1956 the decision was made to install another paper machine at Brainerd. This unit, known as No .6, came on the production line in June 1959, and total paper capacity of the firm was thereby increased by more than 150 daily tons.

Strathmore Tests Provide Better Method To Evaluate Glues for Paper Sizing

A more comprehensive evaluation of animal glues is now possible through a series of tests developed by the paper fellowship at Mellon Institute, Pittsburgh, during the past year. Sponsored by the Strathmore Paper Co., West Springfield, Mass., the fellowship has been investigating methods for evaluating animal glues for surface sizing of papers used in technical applications.

The original study was based upon the premise that viscosity and gel-strength data alone were inadequate in rating such glues for this use. The premise was substantiated by the past year's investigation, and the development of the test series followed.

Of particular interest was the measurement of surface tension by means of the Instron tester. This test not only measured surface tension but also the film-forming or elastic properties of the surface layer of glue dispersions. Such elasticity was adversely affected by zinc salts used as preservatives and by the presence of certain amounts of glue disintegration products.

Owing to the nature of commercial glues, various measurements of swelling or the imbibition of water were of doubtful value. Some glue test results were erratic unless the glue dispersion had aged sufficiently at the temperature of the test to allow the glue and water to reach a hydration equilibrium. This was particularly true with the test for foaming.

A combination of the various tests indicated the quality and constituents of different glues. But the most reliable method of evaluating the efficiency of a paper-surface sizing material proved to be measurement of the depth of penetration of a light-sensitive coating solution, applied to samples under standard conditions.

This year the Strathmore fellowship attained its 31st year.

New Process to Recover Sand Dune Water Makes Possible Another Pulp-Paper Mill

Menasha Wooden Ware Corp.'s announced plans (August issue) for building a 100-ton pulp-paper mill near North Bend, Ore., on the shores of Coos Bay, indicates that the local water problem has been solved. Although it will be the third pulp mill in the Coos Bay area (the first one was unsuccessful), it will be the first to effectively subsist on mill residues. Disposal of lumber and veneer residue wood has long been a problem to this important, busy coastal forest products industry center.

According to President Mowry Smith, this will be a neutral sulfite semi-chemical mill operating on residues from the firm's plywood and lumber plant in the area and on alder logs. The resultant paper-paperboard production will be supplied to Menasha's container plant at Anaheim, Calif. and to other converters. Production start-up is expected early in 1961.

Lack of Water

Even though raw-product wood has long been available in the Coos Bay area in the form of mill residuals, the lack of economical water supply has, until now deterred construction of pulp mills for utilizing this type of wood. Coastal streams in this part of the country vary extensively in regards to seasonal flow and have long tidal stretches. Water economics has, consequently, been an effective barrier to building pulp mills here to utilize wood residues. The only existing pulp mill on the southern Oregon coast is Scott Paper Co.'s Coos Bay Pulp Corp. at Empire. This sulfite mill, of around 100-ton capacity was built to utilize wood from logs rather than chipped residues.

That the Menasha mill can operate without erecting dams and providing extensive piping for its water supply is the result of a process having been developed for recovering fresh water from sand dunes. This developmental work, carried on by Pacific Power & Light Co. during the past few years, has already resulted in determining the availability of water on 13,000 acres of sand adjacent to the ocean and Coos Bay ship channel. By spending a half million dollars and five years of effort on the project PP&L has been convinced this 22 square miles holds around 38 million gallons of fresh water above sea level.

Sands Act as Sponge

In this high rain-fall area (65 in./yr.), the sands apparently act as a sponge—reportedly taking on a supply equivalent to 63 million gal. per day over the 13,000 acre tract. Although several million gallons are drawn out of the area daily by tidal action, small lakes in the dunes remain at constant level throughout the year. The sand-dune water table averages 39 ft. above sea level.

On a test basis PP&L have been pumping 1.5 million gallons of fresh water daily for several months from three of its sand wells. This utility form is preparing to enlarge the supply to provide the pulp mill with water —initially 2½ million gallons daily.

DR. KRAFT . . . he heads International Bleaching Conference set for Chicago—next year.

International Bleaching Conference to be Held in Chicago, June 1960

An International Pulp Bleaching Conference which is expected to have international appeal is to be sponsored by TAPPI (U.S.A.) at Chicago's Edgewater Beach Hotel, June 14 to 16, 1960.

Dr. Ferdinand Kraft, Marathon Div., American Can Co., Menasha, Wis., U.S.A., chairman of TAPPI's pulp purification committee is making preliminary arrangements for the conference. R. J. Richter, Kimberly Clark Corp., Neenah, Wis., is technical program chairman.

Plans call for six technical sessions on principles, reaction mechanisms, kinetics, practices and equipment of modern pulp bleaching, also a panel discussion by international visitors concerning current world wide pulp bleaching practices.

FIRST PUBLISHED REPORT:

New Continuous Digester

with vertical upflow for close control, successfully introduced at Hammermill Paper Co., producing hardwood NSSC pulp

By L. ALLAN CARLSMITH, Project Engineer, Improved Machinery, Inc.,
ROYAL H. RASCH, Head of Research Laboratory, Hammermill Paper Co.,
ELMER F. DHUS, Project Engineer, Hammermill Paper Co.

Erie, Pa.

● As the final step in a long cooperative development program, a continuous digester of completely new design is now producing hardwood neutral sulfite pulp for bond and other fine paper grades at Hammermill Paper Co.'s plant here.

The digester is a part of Hammermill's long-term expansion program which will increase their capacity for production of hardwood pulp by the Neutracel® process and which includes changes in pulping facilities, bleach plant, wood room, finishing room, power plant and water supply. *(First published description of the Neutracel plant and process appeared in PULP & PAPER, page 88, May 1956).*

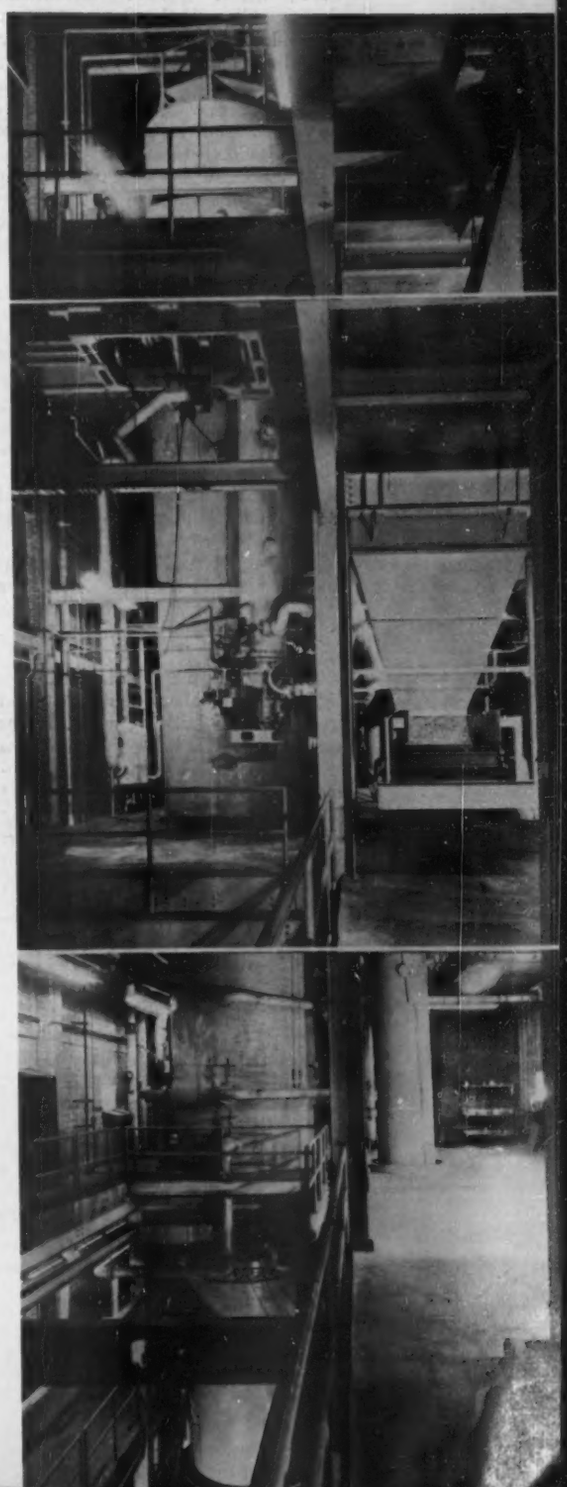
The design of the digester was begun over six years ago when Improved Machinery Inc. decided to enter this fast developing field and retained the late Lloyd ("Curley") Lang* to initiate the development. Mr. Lang had a life-long interest in this area, and was singularly well suited for the task. In particular, he had done extensive work in the development of batch digester circulating systems, which had impressed him with the necessity of designing for closely controlled temperature conditions in order to obtain pulp uniformly cooked.

Digester Design Began in 1952

Starting in the fall of 1952 a searching inquiry was made into the process requirements for a continuous digester which would operate on any of the major pulping processes. By the summer of 1953 it was decided that a drastic departure from previous attempts was necessary—the digester would have to be of the vertical, upflow type, with close control of the movement of chips and liquor through the system. Whereas upflow systems had been proposed and even tried before, this approach had never gained commercial acceptance presumably because machinery had never been designed which adequately solved the problem of propelling the chips up through the digester without damage.

In the spring of 1954 the project was discussed with Hammermill Paper Co., which was considering future expansion of pulping capacity. Hammermill's research department had been studying continuous cooking and had concluded that a vertical type of digester using conventional reaction times and chip sizes was desirable for the production of bleached pulps. The Impco approach was especially suited for this type of operation, and from early informal discussions, a cooperative effort evolved. A series of laboratory cooks was made to determine exact conditions under which Hammermill's Neutracel process could be

*It was a source of sorrow to many that "Curley" Lang was not present to see the first pulp blown from the new digester. His death in De Pere, Wis., in March, 1958 ended a career rich in association with the pulp and paper industry of this country.



COMPOSITE VIEW of Hammermill's new digester—Three photographs, taken respectively from second floor, third floor and third floor mezzanine, show the floor height of the digester from bottom to top including Chip Lifter at the bottom, heating circulation pipe lines in the middle, the fiberizer blow valve on the third floor; then on the right a portion of the impregnator vessel on the second floor and a good view of the chip surge hopper and apron conveyor which is the primary rate meter for the system. A large sheet metal structure on the extreme right is a chip elevator which brings chips from the bottom of a storage silo to the top of the surge hopper.

CONTINUOUS DIGESTER – Chip Lifter moves chips up

conducted in a continuous digester. Specific equipment design was begun by Impco engineers and detailed flow and heat arrangements were drawn up.

New Types of Equipment

The initial design was presented for discussion at Hammermill in the spring of 1955. At this point the process principles appeared to be well worked out, but the mechanical equipment, which was of conventional design, still needed refinement. Hammermill engineers and operating personnel emphasized the need for mechanical simplicity and a minimum number of moving parts, to reduce downtime and maintenance. Impco soon provided this with the novel Chip Lifter, a machine for moving chips upward through the digester, and the Skew-jector, a high pressure feeder which could handle both chips and liquor.

The concept of the Chip Lifter was so unusual that it required prior demonstration, so a pilot unit was built and installed at Hammermill in the winter of 1955-56. The practicality of the machine was demonstrated, and the program went into high gear to design and build a production digester.

During the period of design and manufacture, the Skew-jector was given top priority, and the full sized machine was completed and tested at Impco's plant in Nashua, N. H. This was also successful, and the machine was promptly included in the arrangement.

The story of the installation of the digester and auxiliary equipment, and erection of the building which houses it can be properly told only in the context of the overall expansion of pulping and papermaking facilities at Hammermill which is encompassing a period of several years. This report will be given in a separate article in this magazine in the October issue.

As would be expected in a plant containing so many new ideas and designs, a period of trials and exploratory experiments was necessary. Some modifications were required. Sustained continuous operation was achieved in Feb., 1959, after which there was a further period of refinements to make operation fully automatic. During the spring of 1959 the technical group which had conducted the start-up was gradually replaced with mill operating personnel and the unit was brought into steady production supplementing batch digester operation in the older part of the plant.

Sized for 250 Tons per Day; Sodium Base Cooking Liquor

The digester was designed to Hammermill's specification for a nominal capacity of 125 tons of moisture-free bleached pulp per 24 hours, with all equipment sized for 250 tons per day in case it should prove economically feasible to pulp at higher temperatures and correspondingly shorter retention times. Since the overall bleached yield of the process is on the order of 50%, these rates correspond to 250 and 500 tons per 24 hours of moisture-free wood chips.

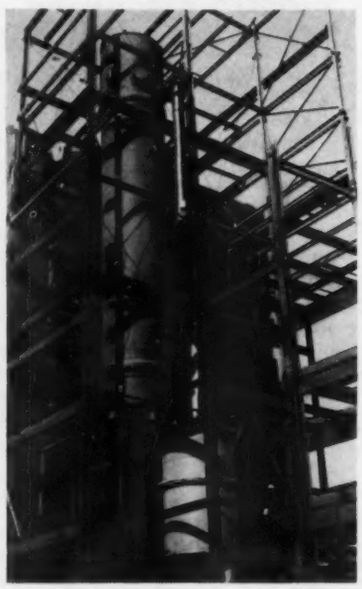
The nominal retention time at cooking temperature is 150 minutes at the 125 tpd rate; however, the Neutracel process is flexible and high quality pulp can be obtained at widely varying cooking temperatures and times. In order to allow full latitude for experimentation, all pressure equipment was designed for 250 pounds per square inch. Further, since the retention time is longer than might be encountered with other processes using this size of equipment, all machinery was designed so that with increases in power and speed, it would be capable of even greater capacity.

Conventional mill-size wood chips are used, the supply being mixed hardwoods obtained in the Erie area. Cooking liquor is of sodium base, and the same composition as developed for the batch operation. Pulp from the new digester is delivered to the pulping and subsequent bleach plant operations without modification to the treatment used for batch pulp except that the continuous pulp is received in a more highly refined state as a result of the action of the digester discharge system.

Upflow for Thermal Stability

The basic advantage of the upflow digester is its inherent thermal stability. Since all of the major pulping processes involve heating the wood chips and liquor to a high reaction temperature and holding that temperature until the reaction is complete, a continuous digester will have low temperatures at the infeed end and high temperatures at the discharge end. In a vertical digester, thermal convection will rapidly carry hot liquor to the top and cold to the bottom, until the system becomes stabilized with temperatures constant across any horizontal cross-section and increasing from bottom to top.

In a downflow digester this relationship is inverted, requiring high cross-flow pumping rates to try to maintain uniform temperatures and special



REACTOR VESSEL, (cover picture) with discharge vessel attached to it, mounted in place on its steel supports with building steel framework partially erected. In foreground is Chip Lifter, resting on its slide-out supports in the service position. Partly visible behind Chip Lifter is impregnator tank. None of the machinery had been installed at this point.

New Continuous Digester Has . . .

THESE FEATURES:

- Sized for 250 tons per day
- Sodium base cooking liquor
- Downflow pre-retention vessel
- Pressurized upflow reactor
- New types of equipment
- Liquor, chips flow independently
- Strength, cleanliness same as batch
- Consistent quality control

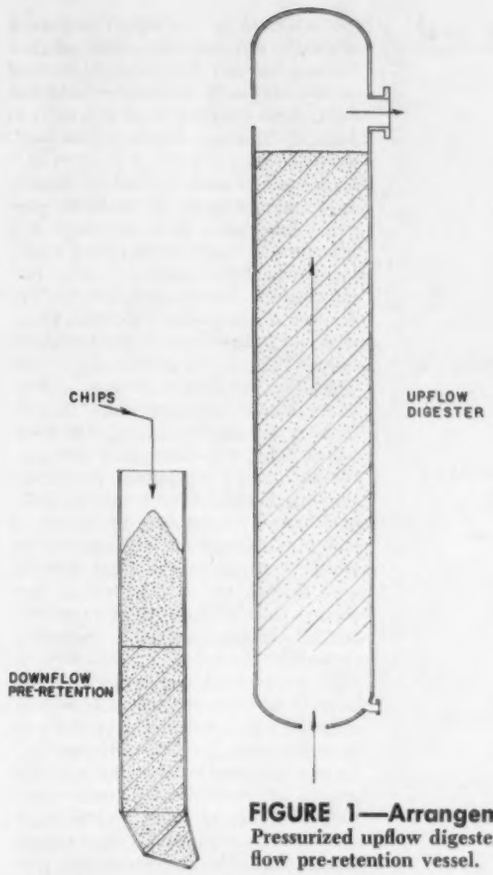


FIGURE 1—Arrangement Without Equipment: Pressurized upflow digester or reactor, preceded by downflow pre-retention vessel.

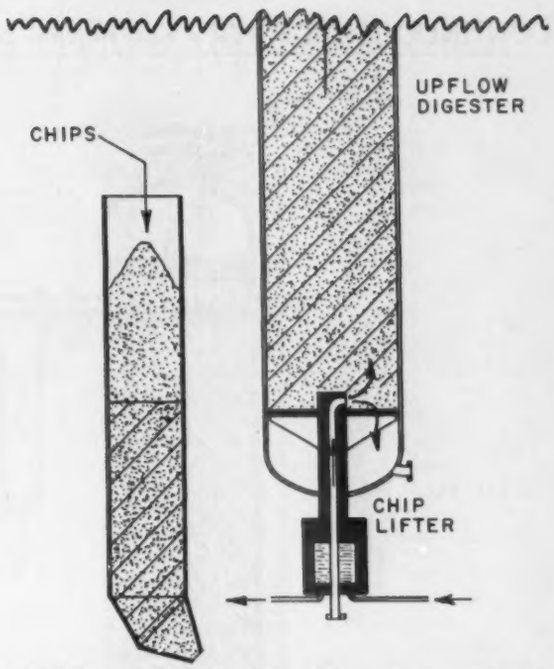


FIGURE 2—Chip Lifter Shown Schematically: Solves basic problem of upflow digester, how to move the chips upward through vessel.

operating procedures at start-up and shutdown. It has been Hammermill's experience so far that stable temperature gradients of as much as 100° F. can be maintained in the upflow digester in only a few feet of height. Countercurrent heating of the chip mass is also possible, with hot liquor from the circulating belts flowing downward through the upwardly advancing cold chip mass. The heating efficiency inherent in this system allows the use of small flow rates in the circulating systems, approaching the theoretical rates for countercurrent heat transfer. These favorable conditions result in uniform cooking and consistent quality control.

The Chip Lifter[1] is essentially a large perforated piston mounted inside the reactor vessel at the bottom, which periodically advances the entire chip mass upward through the vessel by pushing it from the bottom. The piston extends to the full diameter of the vessel to insure uniform, nonchanneling movement of the chips. Chips delivered into the high pressure system are sluiced onto the top of this piston, the liquor flowing through to a recycle connection and the chips being deposited in a layer evenly distributed over the full area of the reactor. As the piston moves upward in its stroke, it compacts this layer against the bottom of the mass of chips filling the vessel, then moves the whole pile upward a distance equal to the thickness of the new layer of chips. The total height of the stroke is about one foot and the rate of cycling is selected for each installation well in excess of the theoretical rate for the nominal tonnage, so that surges or higher operating rates can be accommodated.

Since the feed to the Chip Lifter is continuous, the top of the piston is made of helicoid shape (not shown in Fig. 2) and the step in the helicoid provides a transient storage space to receive chips during the upward stroke. The piston is rotated part of a turn at the end of each stroke to insure even distribution and packing of chips in the vessel. The force required to move the chip mass upward is provided by a hydraulic cylinder, and the cycle is automatically controlled by a conventional hydraulic valving system.

The pressure developed by the Chip Lifter piston against the bottom of the chip pile is low, since the entire cross-section of the vessel is utilized. It was an important design requirement that the chips should not be crushed or damaged at any stage. The success of this design is evidenced by the low power requirement of the Chip Lifter—30 hp for the 250 tpd rate at Hammermill. Moderate pressures are sufficient, however, to achieve a high degree of packing in the reactor. Preliminary experiments on the pilot sized unit indicated that the wood chip density is approximately 50% greater than loosely piled chips, giving a large saving in digester size.

The Skew-jector[2] (because the rotor axes lie in a skew or non-intersecting relationship) is a positive displacement feeder and pump of the intermeshing twin-screw type.

The action and design of the rotors assures non-plugging operation at very high wood to liquor ratios, so that pumping power is kept to a minimum. This action also insures that chips are

[1]Patents: U.S. 2,878,116 and 2,878,117; France 1,171,502; Italy 567,437; Gr. Britain 798,277; Patents pending in other foreign countries.

[2]Patent applied for in United States and other countries; Belgium Patent, 563,405; Italian Patent, 582,342.

CONTINUOUS DIGESTER – has normal pressure seal

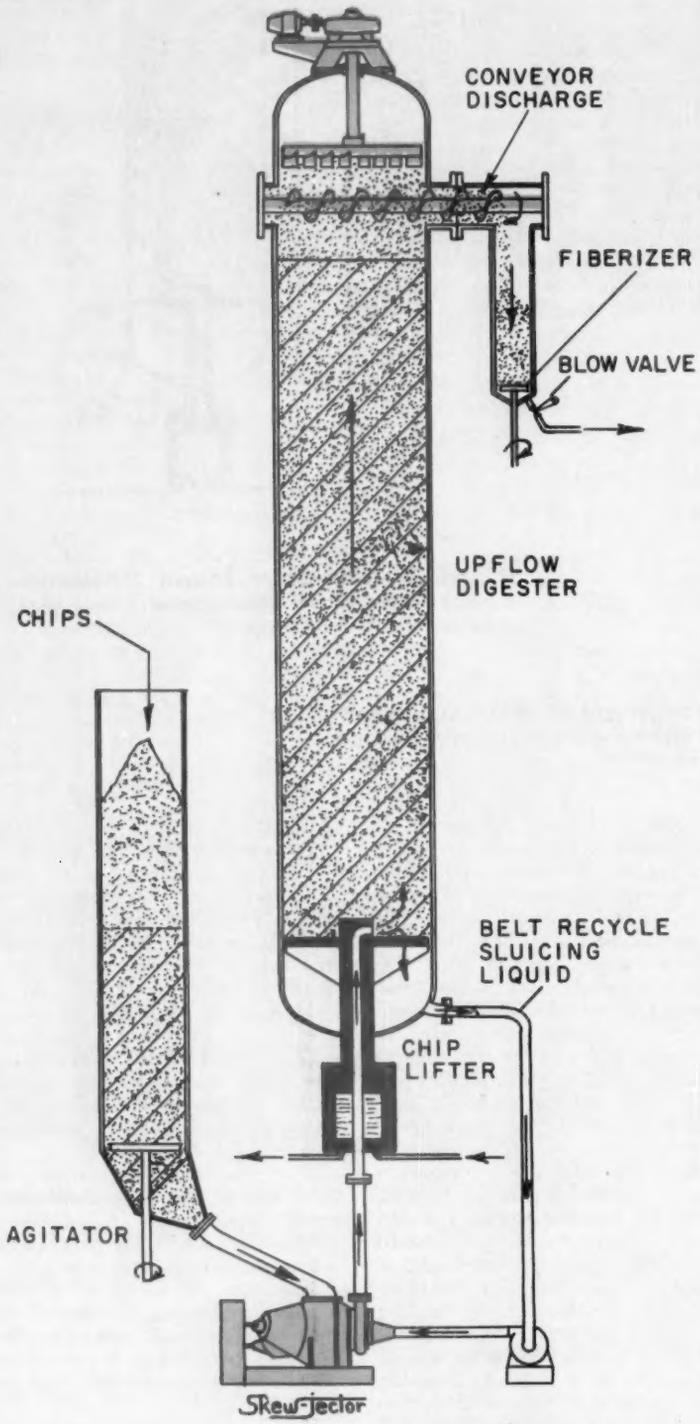


FIGURE 3—Skew-Jector Is Added To Schematic Drawing:
Of novel design, this is high pressure seal at the infeed end of the upflow digester

not crushed or damaged in passing through the machine. The original Skew-jector at Hammermill is rated at 250 psi discharge pressure, and had been previously tested at chip rates as high as 900 tpd moisture-free hardwood chips.

A basic feature of this machine is that when stopped it positively prevents backward flow of chips and liquor (except for a small rate of liquor leakage past the rotors) so that no further safety devices are required to prevent a dangerous "blow-back" in case of electrical or transmission failure.

At the top of the reactor a very heavy screw conveyor and a scraper remove the cooked chips to the blow valve. The conveyor cuts its own trough in the upwardly advancing chip mass and conveys this material out through an opening in the vessel wall into a large "tee" of pipe, out of which it drops into a short vertical pipe leading to the blow valve. The scraper moves the balance of the cooked chips into the conveyor "trough".

In the original installation at Hammermill an attempt was made to simplify this arrangement by utilizing two conveyors and a set of stationary deflectors in place of the scraper. The second conveyor was mounted horizontally above the first and at right angles to it, so that it also cut a trough in the chip pile, conveying this material from both ends toward the center, where it was transferred to the lower screw. The four corners of the chip mass left by the conveyors were upset by the deflectors so that they fell into the conveyors from above. This arrangement was operated successfully for several months, but it gave an irregular discharge, so the scraper was installed on mountings which had been originally provided. With the final arrangement steam consumption is low and the orifices can be left at the optimum setting for any given tonnage rate.

In Future to Omit Screw Conveyor

It is expected that in future installations the screw conveyor will be omitted altogether, with the scraper arranged to discharge directly through the side of the reactor as is done in upflow high density bleaching towers of recent design.

The pressure seal on the discharge end of the apparatus is of the variable orifice type. The chips fall to the bottom of the small surge pipe and encounter a pair of rotating blades which exert a mild defibering action to reduce the material to a size which will pass through an orifice. A coarse strainer just below the blades prevents

oversize material from reaching the orifices. Below the strainer a second pair of blades rotate, one to prevent plugging of the strainer and the other to clear the orifices. Three orifices are provided, to allow a wide variation in discharge rate. They are of easily replaceable design, and constructed of wear resistant material. Adjustment of the opening is remotely controlled from the operating floor. Provision is made for "hot blowing," "cooled blowing" or fully "quenched blowing."

As described, the chip mass advances as a mass or plug, so that channeling or "short circuiting" cannot occur. Packing of the chips is uniform, preventing "loose spots" which could cause uneven liquor flow.

Because the piston is perforated it acts on the chips only, and does not affect the movement of the liquor, nor does the flow of liquor in any way affect the movement of chips. Thus, numerous variations are possible to suit process conditions. The indirect heating circulation can take advantage of countercurrent flow, with heated liquor entering at the top of the stage, moving down through successively cooler layers of chips and leaving at the bottom. This is shown in Fig. 4. With this arrangement only slightly over the theoretical liquor rate to heat the chips to the desired temperature need be circulated, so that pumps, piping, heat exchangers and strainers can be of minimum size.

The liquor in the reaction zone can also be arranged to flow in any desired pattern: cross-flow, countercurrent flow, or concurrent flow with the liquor velocity less, equal to or greater than the chip rate. At Hammermill it was decided to carry the spent liquor along with the chips, but to drain it from the chips just before discharge for heat recovery. It is no longer necessary, however, to use a liquor concentration adjusted to give proper submergence of chips, as in a batch digester, and although batch strength liquor is presently being used, this flexibility is being considered for future liquor plant operation.

The ability to remove all of the drainable spent liquor before discharge of the chips is not only utilized for heat recovery, but also figures prominently in plans for future installation of countercurrent washing and chemical recovery. It is estimated that the organic solids removed by draining while the cooked pulp is still in chip form corresponds to the same quantity that would be removed from the first stage of a conventional three stage countercurrent vacuum filter washing system. Furthermore, this liquor is received for chemical recovery at full digester concentration.

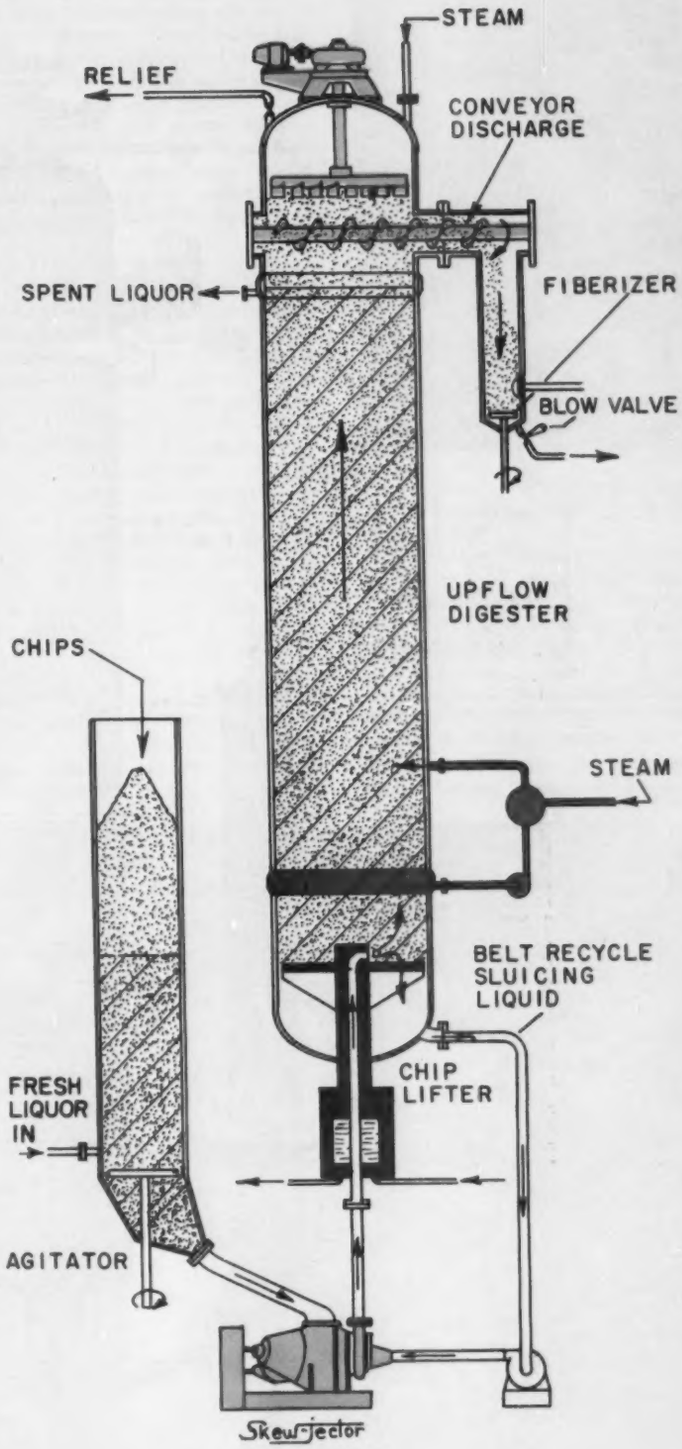


FIGURE 4—Liquor and Chips Flow Independently:

Use of the Chip Lifter offers advantages to both the process and equipment design.

CONTINUOUS DIGESTER – upflow digester has thermal stability

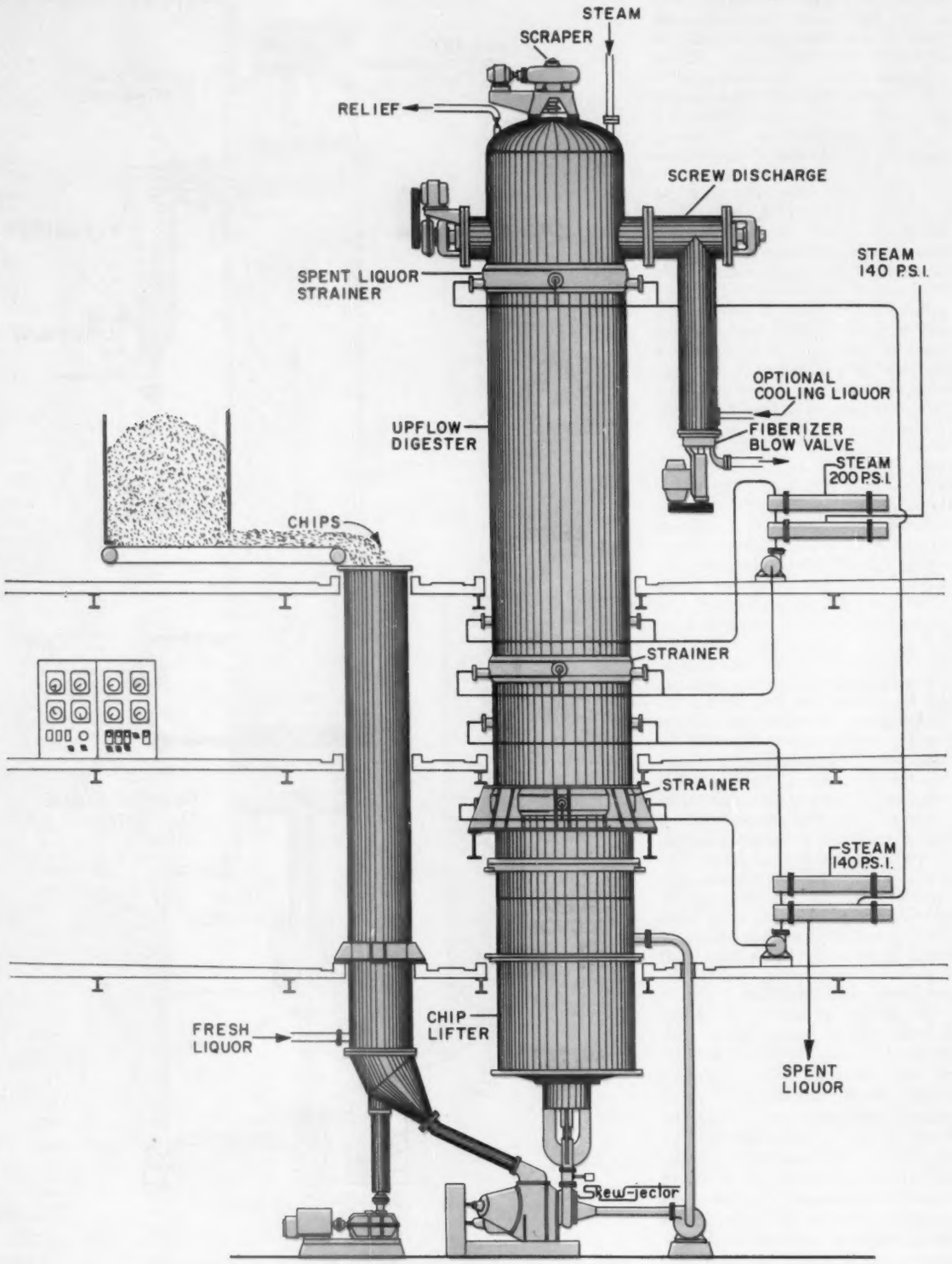


FIGURE 5—Hammermill No. 10 Digester.
Shown in simplified flow sheet form.

Arrangement at Hammermill

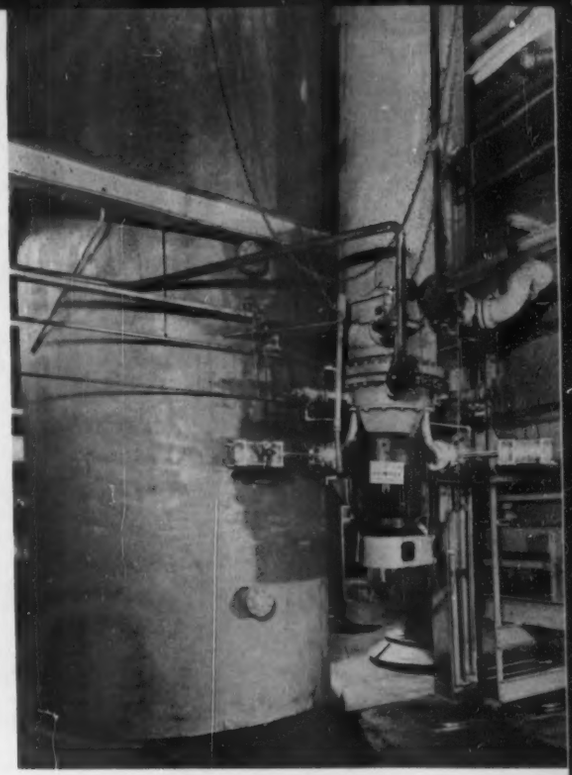
Chips are conveyed from a silo to a small surge hopper, from which they are volumetrically metered by a pan conveyor into a downflow soaking or impregnating tower ahead of the Skew-jector. Fresh cooking liquor is metered into the bottom of the impregnator. The chips and liquor are transferred from the atmospheric impregnator into the pressurized reactor by the Skew-jector. Running at constant speed, the Skew-jector pumps a slight excess of liquor, which is returned through a recycle valve to balance the flow into the reactor.

Chips and liquor from the Skew-jector are sluiced into the Chip Lifter, which advances the chips slowly up through the reactor as a compact mass. The liquor moves independently of the chip mass, finally overflowing through a strainer at the top. Cooked chips are continuously removed at the top of the reactor by the scraper and conveyor which drops them, still under pressure, into the fiberizer blow valve. A blow line leads to a cyclone, from which the stock is sluiced to the washing and refining system.

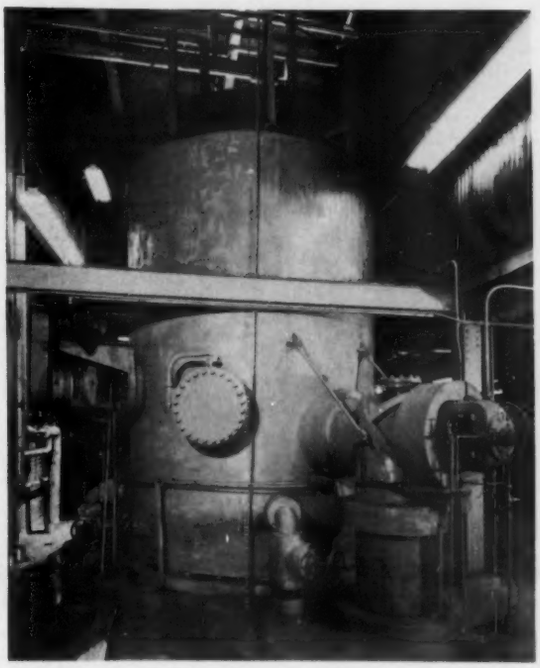
Recent laboratory data for the Neutracel cooking process have shown that the atmospheric impregnation period is unnecessary and this has been confirmed in operation of No. 10 digester, so this feature is not presently being used. Since the original flowsheet was arranged for heating to about 210° F. in the impregnator, this change in operation required relocation of several heat exchangers and now all heating is done in the two reactor stages. As shown in Fig. 5, liquor is withdrawn from each of two circumferential strainers, pumped through heat exchangers and reinjected at a higher level. Since the circulated flow is in excess of the fresh liquor supply moving up through the reactor, the net flow between each strainer and its corresponding injection port is downward, resulting in countercurrent heating of the chip mass.

Spent liquor drained from the chips at the top of the reactor overflows through a third strainer and is returned at full reactor pressure through heat exchangers in the first heating stage. Here it heats incoming liquor before being discharged at atmospheric pressure.

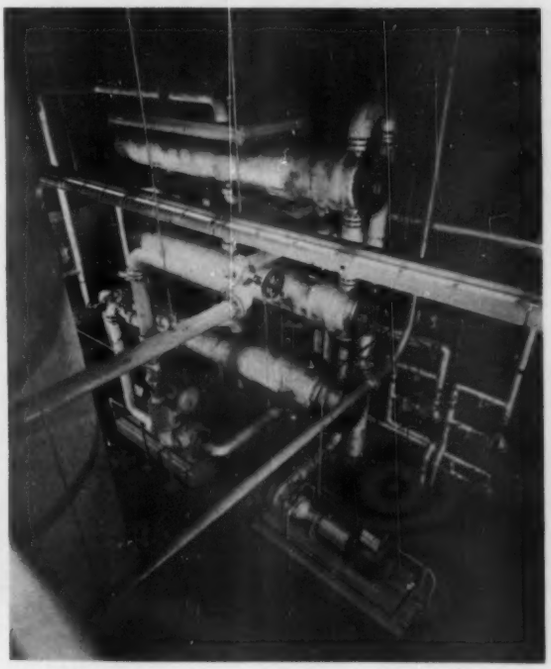
Two stages of heating are provided in the reactor primarily to utilize available steam sources to best advantage. Steam at 140 psig was available close to the new digester building and is used for the bulk of the heating. For high production rates and for certain experimental reasons, however, steam at higher pressure was required, and this can be used in the upper heating stage when needed.



HOW DIGESTER IS BLOWN. View of fiberizer blow valve mounted on bottom of discharge vessel and showing two of three elbows leading to blowline. Large cylinder valve operators operate shut-off gate valves to seal off blowline and small positioner control operators (just under flange) operate orifice valves themselves. Pipe leading in at upper right is for optional re-injection of cooled spent liquor for "quenched blowing."



TOP OF UPFLOW DIGESTER (or reactor), showing bearing housings for two conveyors. On right is top of discharge vessel. Chips are conveyed out into this "tee" and dropped down vertical discharge vessel.



UPPER HEATING STAGE. Heat exchangers are by Struthers Wells. Also shown are circulation pumps in the foreground and sweeping up the wall is the blowline.

For operating flexibility the high pressure supply is also used in the top vapor space of the reactor.

Problems During Start-Up; Refinements at Hammermill

The liquor circulation strainers are of an entirely new, self-cleaning design and the dimensions originally tried allowed too many small chip fragments to pass through, so that heater plugging was a problem. These were modified and operation since has been completely satisfactory. It should be noted that the self-cleaning feature is very successful–the strainers themselves have never plugged in operation.

Since the digester has been in production, occasional cleaning has been required to remove accumulated scale from the liquor side of the heat exchangers. The scale is substantially calcium sulfite and magnesium sulfite and is probably derived from unsoftened water used in liquor preparation. It is thought that with revisions to the liquor making plant this problem can be eliminated entirely. The scale can be readily dissolved with a solution of Oakite No. 32 compound, which has been used for cleaning when required.

Mention has already been made above of experiments with equipment for removing the cooked chips from the top of the reactor.

CONCLUSIONS:

With equipment of such unconventional design, it was to be expected that Hammermill and Impco awaited with much concern tests evaluating the new digester, Results so far have justified the confidence that lay behind the original decision to build the system.

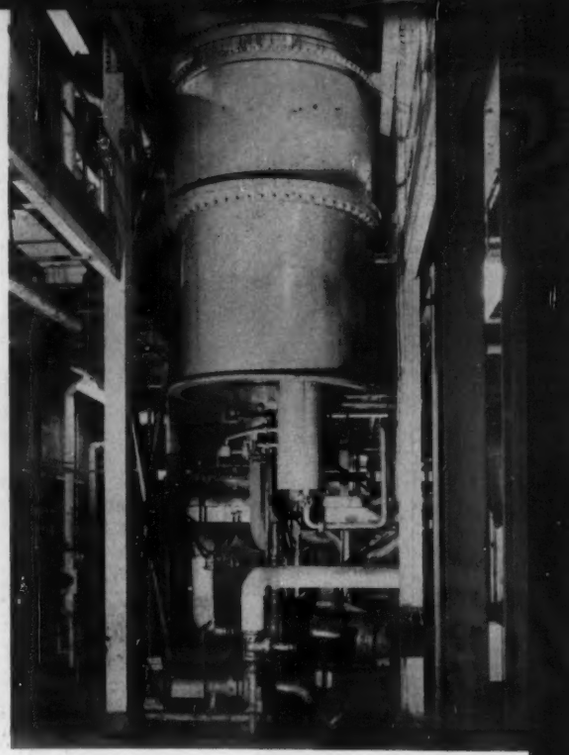
Tests of the permanganate numbers of pulp produced during sustained operation have shown substantially all to be within a range of plus or minus 5% of the desired value. Considering the variability in the blend of wood species being cooked, this has been reassuring evidence as to the uniformity of cooking.

Although production from the continuous digester has at times accounted for nearly 75% of the total Neutracel tonnage, no change in the cleanliness or strength properties has been evident.

The power requirement for fiberizing the crude pulp has been somewhat less than usual, but otherwise, so far as could be seen from subsequent processing operations and papermaking characteristics, it has been as though no change had been made.

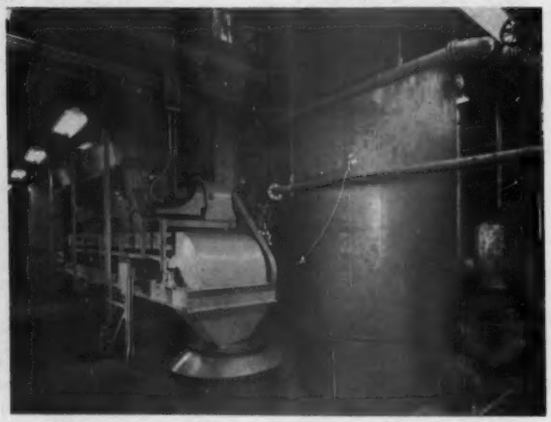
Numerous pulp samples have been taken from the new digester over the periods it has been in operation. These have been bleached in the laboratory and evaluated. In all cases the strength and other properties have been substantially the same as for batch-cooked pulps.

Because the evidence as to pulp quality has been favorable the primary emphasis has been placed on completing the various refinements that would permit transfer of operations to the production department as soon as practical.

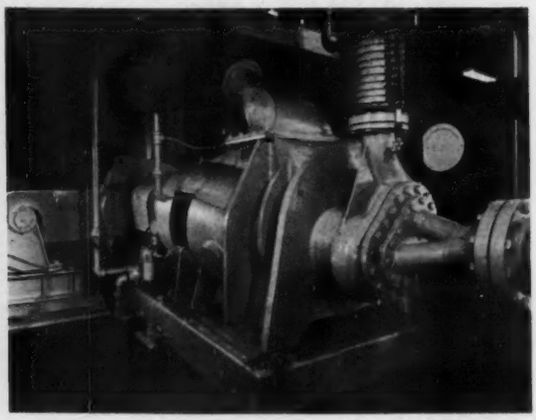


NEW TYPES OF EQUIPMENT USED. View of Chip Lifter, Skew-Jector and impregnator recirculation pump, taken from ground floor.

Since this objective has been attained, specific attention can now be focused on more detailed evaluations of pulp characteristics and quality. We have not been unmindful of the well-known adverse effects on strength encountered in certain pulping operations as a result of mechanical action at high temperatures. Although present experience has indicated no serious problem in this regard, as a result of the method of discharge, experiments are under way in which strength comparisons will be made of stock "blown hot" and stock which has been quenched with water before blowing.



CHIP FEED TO IMPREGNATOR. View of reactor and chip weigh hopper with apron conveyor. Apron conveyor feeds chips downward into top of impregnator, which projects just up through this floor level. In background is fiberizer blow valve with blowline leading across in front of reactor.



THE SKEW-JECTOR—HIGH PRESSURE SEAL at infeed. Chips are sluiced down from impregnator in background through sloping pipe on upper left. They are pumped up to digester pressure and sluiced from discharge casing in foreground upward through expansion joint into Chip Lifter.

List of Principal Suppliers of Equipment for Hammermill Paper Continuous Digester Project

Digester Vessel: Chicago Bridge & Iron Co., Birmingham, Ala.
Impregnator and Auxiliary Equipment: Improved Machinery, Inc., Nashua, N.H.
Recorders and Controllers: Foxboro Co., Foxboro, Mass.
Control Valves: Minneapolis-Honeywell Co., Minneapolis, Minn.
Panels: Lake Erie Electric Mfg., Erie, Pa.
Indicating Thermometer: Rochester Mfg. Co., Rochester, N.Y.
Motors: Reliance Electric Co., Cleveland, O.
Skewjector Motor: Westinghouse Corp., Pittsburgh, Pa.
Controls: General Electric Co., Schenectady, N.Y.
Variable Speed Drives: Louis Allis Mfg. Co., Milwaukee, Wis.
Valves: W. G. Rovang Associates, Portland, Ore.
Valves: Alloy Steel Products Co., Linden, N.J.
Pumps: Goulds Pumps Inc., Seneca Falls, N.Y.
Pumps: Fairbanks Morse Co., Chicago.
Pipe Fabricating: Bristol Metal Products Co., Bristol, Tenn.
Small Pressure Vessels and Blow Tank: Misco Fabricators, Inc., Marysville, Mich.
Pulp Storage Tank: Sharpsville Steel Fabrication, Inc., Sharpsville, Pa.
Heat Exchangers: Struthers Wells, Warren, Pa.
Pump Couplings: Zurn Manufacturing, Erie, Pa.
Safety Valves: Farris Engineering Co., Palisades Park, N.J.
Chip Silo: Stebbins Engineering & Mfg. Co., Watertown, N.Y.
Bin Vibrators: National Air Vibrator Co., Cleveland, O.
Bucket Elevator: Continental Gin Co., Birmingham, Ala.
Reducers and Drives: Falk Co., Milwaukee, Wis.
Rubber Belts: B. F. Goodrich Industrial Products Co., Akron, O.
Conveyor Rollers: Stevens Adamson Mfg. Co., Aurora, Ill.
Conveyor Pulleys, Screw Conveyor, Apron Conveyor and Rotary Plate Feeder: Link-Belt Co., Chicago, Ill.
P & H Heavy Lift Electric Hoist: Harnischfeger Corp., Milwaukee, Wis.
Magnetic Pump: Eriez Mfg. Co., Erie, Pa.
Chip Lifter Hydraulic Motor: New York Air Brake Co., Watertown, N.Y.

Two Canadian Companies Plan Merger

MacMillan & Bloedel, Powell River Co. aim to strengthen competition in other countries. Last year's total sales: $216,400,000

By CHARLES L. SHAW
Canadian Editorial Director

Vancouver, B. C. . . . They say some marriages are made in heaven, and if it isn't stretching the metaphor too far to apply it to industry, the proposed merger of MacMillan & Bloedel, Ltd., and Powell River Co., Ltd., would seem similarly blessed. Combined they own far more standing timber than any other Western Canadian company.

Both companies are giants in the forest industry of British Columbia. Both have their base in Vancouver. The basic policies and objectives of the two companies are almost identical, and their production facilities complement each other with almost incredible precision.

If the merger materializes—and there is little doubt that it will—it will create one of the biggest diversified wood industries in the world. MacMillan & Bloedel, Powell River Co. is the name by which the new combination will be known if shareholders, the SEC and other regulatory boards approve. The range of its products includes newsprint, sulfite and sulfate pulp, lumber, wood doors, shingles, fine paper, flakeboard, kraft paper, bags and specialties.

Here's how the combined annual production of the merged companies stands, on the basis of current capacity:

Newsprint, 2 mills, 725,000 tons.
Sulfite, 1 mill, 40,000 tons.
Bl. sulfate, 2 mills, 300,000 tons.
Logs, 21 camps, 950,000,000 bd. ft.
Lumber, 6 mills, 680,000,000 bd. ft.
Plywood, 2 plants, 320,000,000 sqs.
Doors, 1 plant, 400,000.
Shingles, 2 mills, 390,000 sqs.
Kraft, board, 1 plant, 60,000 tons.
Conv'ting paper, 1 plant, 4000 tons.

In addition, a flakeboard plant to produce about 25,000 tons and a fine paper plant to produce 14,000 tons annually are under construction.

Dominant in West Canada

Both Powell River Co. and MacMillan & Bloedel have held a dominant position in the industrial life of British Columbia for many years. They developed many communities in the coastal area, and their world-wide sales extended to every country that consumes the product of the forest.

Why Did They Unite?

Last year Powell River Co. reported net sales of $55,600,000; they have gone as high as $72,400,000. Net profit was $7,600,000. MacMillan & Bloedel reported gross sales of $160,792,000 against the record of $176,724,000 achieved in 1956. Net profits, which were as high as $18,743,000 in 1955, were $8,109,000 last year. There was nothing in these figures to indicate that either of the companies was suffering.

But the advantages of a merger were apparent, and as long ago as 1957 negotiations got under way, although they were confined to the highest echelons in company personnel and only within the last few months did the way seem clear. When the news finally broke, industry and stock markets were taken by surprise.

No one company is "taking over" the other. Although it will take many months to reshuffle all jobs, departments and other factors for maximum joint benefit, the tentative setup of the top executive slate suggests a complete integration, with no one company dominant. H. R. MacMillan, founder of the original H. R. MacMil-

MacMillan

H. Foley

Clyne

M. Foley

Shaw

"Better Able to Meet Competition from Other Countries"

Top officers of the new company, MacMillan & Bloedel, Powell River Co.: HAROLD R. MACMILLAN, honorary chairman; J. V. CLYNE, chairman; HAROLD S. FOLEY, vice chairman; MIKE J. FOLEY, president; and RALPH M. SHAW, executive vice president.

lan Export Co. and always the "power behind the throne" in M&B, will be honorary chairman of the board; Harold S. Foley, now chairman of Powell River Co., vice chairman, with J. V. Clyne, now chairman of M&B, continuing as active chairman. M. J. Foley, now president of Powell River Co., continues as president of the combined company, with Ralph M. Shaw, now president of M.&B., executive vice president of the new company.

Pressure from Outside Competition

Pressure of competition from outside the Canadian industry and the threat of increasing competition during the coming years were basically the reason for bringing the two B.C. companies together. Both companies are Canadian-controlled, with M&B reported to be 85% owned in Canada, and Powell River 65%.

Both companies have been cognizant of the recent trend towards absorption of forest industry operations in B.C. by U.S. groups—Crown Zellerbach, Rayonier, Scott, Celanese to mention only a few, and there was growing awareness of the B.C. industry's loss, during the past two or three years, of its former share of foreign markets in which B.C. companies were faced with the competition not only of big well financed U.S. corporations, but of overseas countries with much lower costs of production.

"We feel the proposed merger would improve the ability of the amalgamated company, under Canadian control and ownership," said Mr. Clyne and Mr. Foley.

"Each company sells some three quarters or more of its production to the export market. Particularly important will be the expansion of and greater concentration on research, which has become more and more important in our industry and can be pursued with greater vigor by combined efforts and resources. Not least of the advantages will be the strengthened financial position in relation to our large competitors in other countries."

Companies' Background

Looking at the present resources of the two companies and their background it may be evident that, like partners in the ideal marriage, they were "made for each other." Powell River Co. was established many years before the MacMillan empire came into its own.

The Brooks-Scanlon interests of Minneapolis entered the picture in 1909, with the triumvirate of Dr. Dwight F. Brooks, Anson Brooks and M. J. Scanlon forming Powell River Paper Co., later shortened to Powell River Co. The first paper machine went into production in 1912, the forerunner of what eventually became the world's biggest single-unit newsprint mill. There are nine newsprint machines at Powell River now. Harold Foley, long associated with the Brooks-Scanlon organization in the South, joined Powell River Co. as executive vice president in 1936, soon becoming president, and in 1948, he was joined by his younger brother Joe (M.J.) The influence of the Foleys in the company's advance has been deep and unmistakable.

Although many have contributed to the rise of MacMillan & Bloedel its progress is largely the personal success story of one man, H. R. MacMillan, one of the few men in the industry who has witnessed the emergence and growth of a vast corporation, bearing his name, within his own lifetime.

Mr. MacMillan started as a government forester and the basic pattern of B.C.'s forest administration bears his imprint. But government service was too confining for one of "H.R.'s" imagination and drive. He quit the security of a government job to learn the rudiments of the sawmill business as assistant manager of a big export mill, Vancouver Island (one of four mills his company owns today) and in 1919 left that position to form his own organization. Financed at first by United Kingdom capital, he bought timber and mills and his company was a leader when he joined forces with the Bloedel, Stewart & Welch organization headed by Prentice Bloedel.

After World War II Mr. MacMillan built his first pulp mill at Harmac (Bloedel company already had a new bleached sulfate mill at Port Alberni). A measure of M & B's confidence in pulp and paper was the recently completed $83,000,000 expansion at Port Alberni. Powell River Co. has invested close to $100,000,000 in expansion since the war. The company has, at the present time, plans to build a pulp-paper mill as an expansion of Brooks Scanlon, Inc. in Oregon's Deschutes Plateau area (Powell River has a controlling interest). Also under consideration is the establishment of a newsprint mill at Kitimat, B.C., utilizing surplus power from the Kemano plant now serving Aluminum Co. of Canada's smelter.

How Merger Would Work; Exchange of Shares

This is the way financial terms of the MacMillan & Bloedel—Powell River Co. merger will work out if approved by shareholders, and pertinent Canadian and U.S. laws and tax rulings are complied with:

Powell River Co. would split outstanding shares on a basis of two for one, giving its shareholders two shares for one now held; and would offer MacMillan & Bloedel shareholders, from treasury, seven new shares of Powell River Co. for three now-outstanding shares of MacMillan & Bloedel. This is equivalent to one and one-sixth shares of Power River Co. as now capitalized, for one of M & B.

Major Savings for Magnefite

. . . is claimed by two West Coast experts who have made a comparative study of the process. Simplicity is the answer.

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• As pulp consumption has tripled in the past 20 years—and its consumption is bound to increase—newer processes allowing a broadening range of usable wood must be seriously considered.

The Magnefite bisulfite pulping process, for one, now appears competitive to kraft in many areas where kraft was historically considered to have special advantages as far as wood uses were concerned.

Extensive laboratory work during the development of the Magnefite process reported by Dr. George Tomlinson II and his associates of Howard Smith Paper mills (see PULP & PAPER, March 1958) indicated the possibility of modifying the acid magnesium bisulfite process to allow its use for pulping pine and other woods not normally considered suitable for the sulfite process. At the same time, there were indications that improved yield and strength in the resultant pulp could be obtained. This modification involved the use of a magnesium bisulfite splution essentially free of the excess SO_2 characteristic of the acid sulfite process and a relatively high-temperature digestion. The rate of pulping and the yield at given permanganate number were improved by using a quantity of combined SO_2 somewhat greater than that used with acid sulfite pulping at a pH of the initial liquor near 4.5.

Because of the advanced development and lengthy experience with the magnesium bisulfite recovery units in regular operation at Weyerhaeuser Timber Co. (Longview and Cosmopolis Mills), Brown Co. (all in U.S.A.) and Ketchikan Pulp Co. (in Alaska) the Magnefite process held the additional attraction of actual successful operation.

Because of the many possible advantages, Howard Smith Paper Mills Ltd. elected to perform a full mill-scale test of the process at its Cornwall mill in Ontario, Canada, which normally operates on calcium base and therefore does not have the necessary equipment for the recovery of the digestion chemicals.

Changes in the plant were confined to the equipment involved in producing the cooking liquor. Not made were desirable changes indicated in the digester room to allow for more rapid heating and the more economic liquor-to-wood ratios possible with the Magnefite process. Although operating conditions were not ideal, the three and one-half months of operation on the Magnefite process were very satisfactory (see PULP & PAPER, May 1958).

Sawmill Pine Chips Used

Whereas previously the mill had been operated on Canadian spruce hauled over a considerable distance, during this test substantial quantities of sawmill pine chips were used, along with poplar and mixed local softwoods consisting of about 55% eastern hemlock, 25% pine and 20% tamarack. The pine was chiefly pitch pine native to the area. (It should be noted that eastern hemlock is considered an undesirable wood for acid sulfite pulping, unlike western hemlock which is one of the most desirable).

The Cornwall mill-scale operation from March to July 1958 established a number of advantages, including:

1. Use of wood species not previously found suitable for acid sulfite pulping.
2. Increased digester room capacity due to shorter cooking time.
3. Increased pulp yield.
4. Increased pulp strength.
5. Decreased dirt content of pulp.
6. Elimination of digester heater and piping scaling normal with calcium base.
7. Minimization of nuisance of sulfur dioxide odors, particularly in the event of leaks, blown gaskets, etc. and in the blow pit room.
8. Use of hot water for acid making with elimination of need for refrigeration.
9. Simpler storage requirements of acid at elevated temperatures due to reduced pressure at given temperature.

As a further step in the development of the Magnefite process a mill-scale test was performed by Weyerhaeuser Timber Co. at Cosmopolis, Wash. in October 1958 to determine if any unusual problems would be encountered in the recovery plant with Magnefite liquor.

For 60 Hours, No Problems

The Cosmopolis magnesium bisulfite mill placed in operation March 1957 has a modern recovery plant, consisting of two recovery units, served by one set of multiple-effect forced-circulation tubular evaporators, SO_2 absorption and acid-making system.

Operation for a 60-hour period burning only Magnefite liquor showed no problems. From a furnace and evaporator standpoint, it was difficult to observe any change over the regular operation.

The steam production per ton of finished pulp was equal or slightly better than standard acid sulfite. The acid plant was operated on a Magnefite basis with only a minimum of changes and without difficulty. MgOH was added to acid to control combined SO_2

as the acid left the acid plant. The rate of flow of the $Mg(OH)_2$ to the system controls the pH of the liquor, while the rate of flow of make-up water controls the concentration of combined SO_2.

As evidence of the soundness of the Magnefite process seems established, logically the next step to be considered is the one of economics. This, of course, is a paramount question which can only be solved by adequate consideration of the many factors involved in each individual case.

Economics of Capital Costs

The factors of wood supply, market and type of pulp produced can only be evaluated by management with adequate technical assistance from staff and consultants.

The authors do not presume to set forth the final economic study but hope to provide information that will be useful for engineers, pulp mill designers and mill management. Final definitive studies on any project must consider all the economic and technical factors.

In presenting this information it seems appropriate to use the familiar yardstick of bleached paper grade pulp. In one sense, Magnefite can be considered competitive to the kraft process as many species of wood formerly thought commercially suitable only for kraft process now can be considered for Magnefite. As information on capital costs of the kraft process is the most readily available, it was decided to use this as a comparison.

Economics of Capital Cost of Utmost Importance

Accurate comparisons are difficult to obtain. Frequently, comparisons made from one mill to another lead to erroneous conclusions. The difference in terrain, foundations, types of buildings, labor rates and many other factors make the comparison of total cost of one mill to another difficult to evaluate. In this case, the authors have made detailed definitive estimates based on the same concept of equipment quality with the same amount of automation, the same type of building construction for the same location.

Conventional processes without innovations as shown in Figs. 1 and 2 have been used. Admittedly, there is a possibility of savings in capital cost in each process by the use of continuous digesters, evaporative-Venturi scrubbers, etc. Conventional equipment has been used in each process to maintain the common denominator for comparable design.

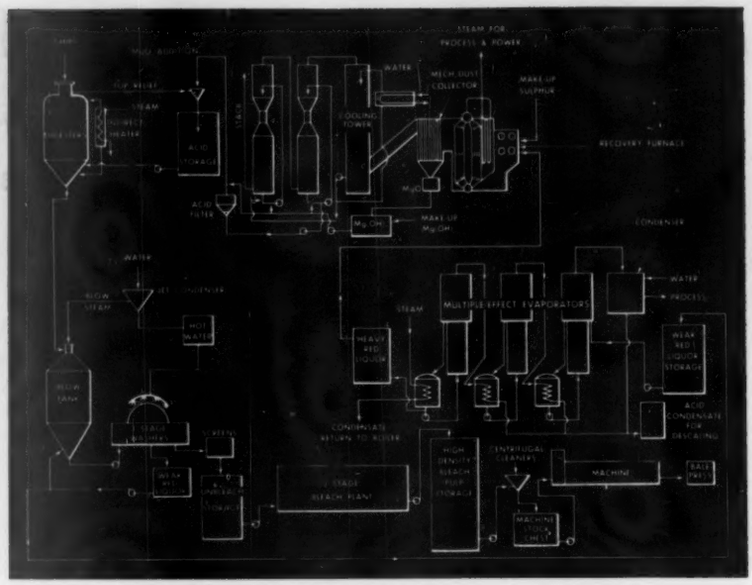


FIG. 1—MAGNEFITE PULPING PROCESS

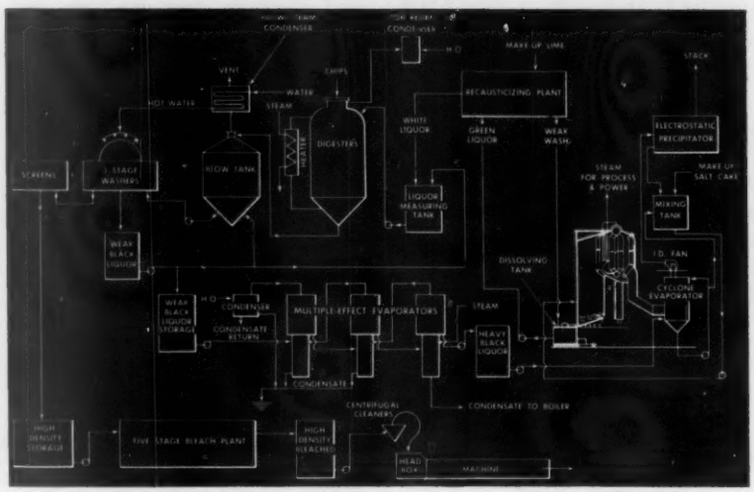


FIG. 2—KRAFT PULPING PROCESS

It is significant that the complete liquor and recovery cycle of the two processes, acid or liquor making, recovery boiler and evaporator are more than $500,000 cheaper for the M_gO recovery system than for the kraft. The other significant differences in the cost comparison of these two processes are the increased cost for sulfite digesters and the extra cost for a kraft bleach plant.

Table II gives pertinent information concerning the major variables in operating costs. In controversial areas, such as yield, etc., broad but comparative values have been given.

Other factors that are becoming increasingly important are both air and stream pollution. While methods of oxidation, etc., have greatly decreased the air pollution nuisance in the kraft mill, it has not been possible to eliminate this factor entirely. With the Magnefite process, it is possible to reduce this entirely or at the most a negligible content.

Stream pollution from the Magnefite process consists of BOD loading without the toxicity problem of the kraft mill. There is evidence that magnefite BOD loading should be more favorable than the standard magnesium bisulfite operation.

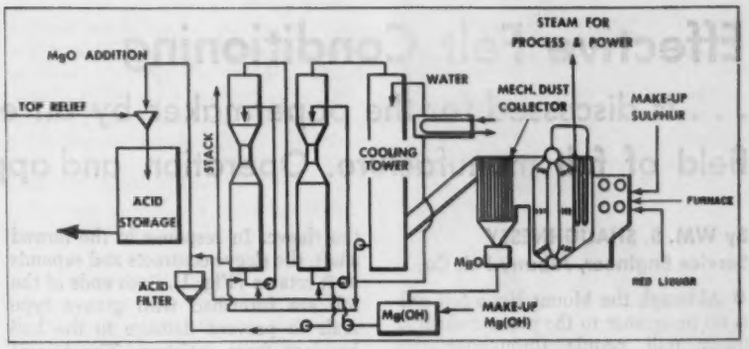
From the above, it appears the

Magnefite process can be now considered competitive to kraft in many areas in which it was formerly considered kraft had an exclusive field as far as wood uses were concerned.

Finally, the simplicity of the combined cooking and recovery operation should result in major savings of capital, maintenance and operating costs.

Table I—Capital Cost Comparison
400-Ton Bleached Paper Grade Pulp Mill
Estimated Construction Costs
(1959—U. S. Funds)

	Kraft	*Magnefite*
Wood Preparation	same	same
Pulping Facilities		
Building	$1,400,000	$1,400,000
Digesters	$1,320,000	$2,210,000
Washing & screening	$1,105,000	$1,255,000
Bleach plant	$2,530,000	$1,565,000
Machine	same	same
Building		
Bleached screen room		
Machine		
Baling & finishing		
Warehouse		
Acid or Liquor-Making	$1,702,000	$1,298,000
Recovery Facilities		
Building	$1,000,000	$ 975,000
Evaporators	$ 712,000	$1,787,000
Recovery boiler	$2,827,000	$1,602,000
Power boiler	$1,191,000	$1,140,000
Turbine	same	same
Feedwater system	same	same
Electrical Distribution	same	same
Steam Distribution	same	same
Raw Water Supply	same	same
Water Treating & Distribution	same	same
Sewers & Disposal	$ 690,000	$ 770,000
Fire Protection	same	same
Shops, Labs & Office	same	same
Site Development	same	same
Undistributed Cost (Engrg., temp. facilities, rental, contractors' fees, interest during construction)	same	same
Contingency (Escalation & labor increases	same	same
Sum of Variable Costs	$14,477,000	$14,002,000



ENLARGEMENT OF PORTION OF FIG. 1 SHOWING B&W RECOVERY UNIT

Table II—Estimated Operating Cost Comparison
400-ton Bleached Paper Grade Pulp Mill
(1959—U. S. Funds)

		Kraft	*Magnefite*
Bleached Yield		38% to 41%	40% to 45%
Wood Costs/Ton of Pulp @ $19/ADT of chips		$50.-$46.50	$47.50-$42.00
Chemical Costs			
Unbleached			
Salt cake	100#/ton @ $0.016/#	$ 1.60	
Lime (CaO)	50#/ton @ $0.015/#	.75	
Sulfur	50#/ton @ $0.015/#		$ .75
MgO	25#/ton @ $0.04/#		1.00
Total		$ 2.35	$ 1.75
Bleach Chemicals			
°CL_2—Kraft	230#/ton @ $.03/#	$ 6.90	
Magnefite	180#/ton @ $.03/#		$ 5.40
°NaOH-Kraft	150#/ton @ $0.3/#	4.50	
Magnefite	60#/ton @ $.03/#		1.80
Total		$ 11.40	$ 7.20
Steam Produced/ADT 1000 Btu/#		11,500—12,000	12,000—12,500
Water Cost		same	same
Power Cost		same	same
Labor Cost		same	same

°Includes hypochlorite

Pulp and Paper Waste Conference in Chicago Dec. 1-2

A North American Pulp, Paper and Paperboard Industrial Waste Conference will be held at the Edgewater Beach Hotel, Chicago, Dec. 1 and 2, jointly sponsored by the National Council for Stream Improvement, Inc. Institute of Paper Chemistry, and the Sulfite Pulp Manufacturers' Research League.

The program committee consists of N. L. Malcove and A. J. Wiley, technical director of the Research League; Dr. Willis M. Van Horn, the Institute; Arthur Van Vlissingen, Pulp and Paper Information Service; Russell L. Winget, executive secretary, and Dr. Harry W. Gehm, technical advisor, National Council.

The purpose is to accomplish an exchange of all pertinent basic data relating to this industry's waste disposal on an inter-regional basis. Experts will present papers. George E. Dyke, chairman, board of governors, National Council, will preside and the opening address will be given by Dr. John G. Strange, who is president of the Intsitute.

The program will be devoted to the broad problems of stream sanitation and waste treatment and waste disposal applicable to all types of pulp and paper wastes and is open to all pulp, paper and board manufacturers, government agencies and institutions.

Effective Felt Conditioning

. . . is discussed for the papermaker by an expert in the field of felt manufacture. Operation and application stressed.

By WM. S. SHAUGHNESSY
Service Engineer, Albany Felt Co.

● Although the Mount Hope felt roll is no newcomer to the paper industry, many mill people throughout the country are still not familiar with its potentialities in connection with paper machine felts.

One objective of the roll made by Mount Hope Machinery Co. is to widen the felt as it passes over the roll. The Mount Hope roll will have the greatest widening effect if the felt wrap is 120° measured from the line of contact of the felt on the roll as it approaches the roll to the line of contact of the felt on the roll as it leaves the roll. However, only a small amount of wrap is necessary in order to maintain the desired width of the felt.

The roll can also be used to straighten the guide line when a felt is running cocked. This restores the mesh to its normal spacing, helps keep the felt open.

Further, the roll can be used to increase the running width of a felt if so desired, even though the felt may already be running at its designed length and width.

Roll Structure

There are two basic types: the fixed bow and the Vari-Bow expander.

The core of the fixed bow type is a steel shaft that is bowed under pressure. The amount of bow is calculated for each installation.

Mounted on the bowed shaft is a series of ball bearing spools supporting a sleeve of special rubber. The inner races of the bearings are fixed to the shaft, the outer race rotating with the sleeve. In response to the bowed shaft, the sleeve contracts and expands as it rotates (Fig. 1). Both ends of the roll are furnished with groove type seals to prevent damage to the ball bearings from moisture. The bowed shaft is mounted in ball and socket brackets so the plane of the bow can be rotated and held in position by these mounting brackets.

Theory of Operation

There are two theories that explain the operation of the roll: (1) The guide roll principle; (2) expansion of the rubber sleeve.

The guide roll principle states that each particle of a felt will creep along until it is traveling perpendicular to the axis of the roll. The Mount Hope roll may be considered to be an infinite number of minute rolls integrated over an arc. (Fig. 2). Therefore, any felt passing over the roll will expand all along its width, each portion trying to travel perpendicular to the axis of the roll.

By contrast, a conventional spread roll exerts a sharp point of difference in the direction of the forces expanding a felt. This often results in streaking or wear of the center of the felt.

Under the second theory, expansion of a felt is caused by expansion of the rubber sleeve.

Roll Design

The four basic design factors which affect the operation of the Mount Hope roll are: (1) Amount of bow; (2) degree of wrap; (3) position of preceding and following carrying rolls; (4) plane of bow.

If the amount of bow is increased, the degree of expansion and contraction of the rubber sleeve and the spread roll effect will also increase. Therefore, the more bow in the roll, the greater will be the widening effect on the felt for a particular amount of wrap.

WILLIAM SHAUGHNESSY: "To promote a better understanding of practical application."

The widening effect of a felt varies directly as the amount of its wrap on the roll. That is, the greater the amount of wrap, the greater will be the actual widening effect—up to 120°.

The positive contact of the preceding roll will tend to stabilize the size of the felt against the guide roll principle. Therefore, the closer that roll is placed to the Mount Hope roll, the less will be the expanding effect on the felt (Fig. 3).

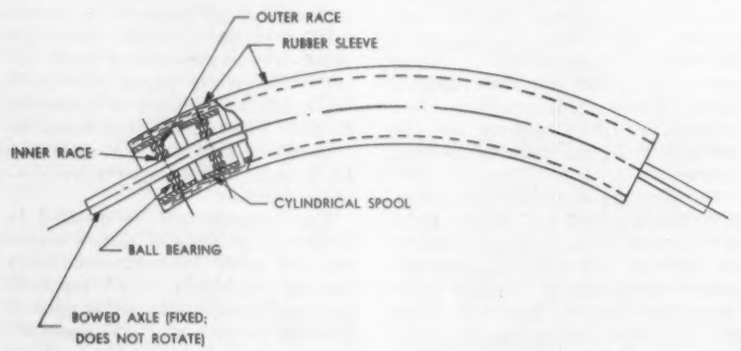


FIG. 1—Mount Hope roll, primary components.

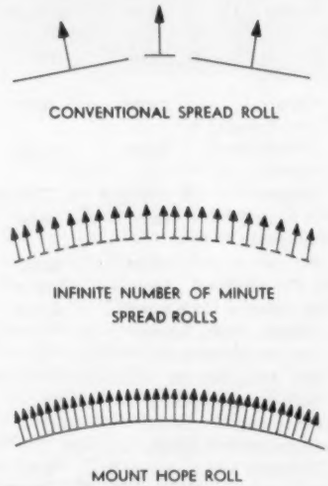


FIG. 2—Force direction on types of spread rolls. Arrows indicate the direction of force.

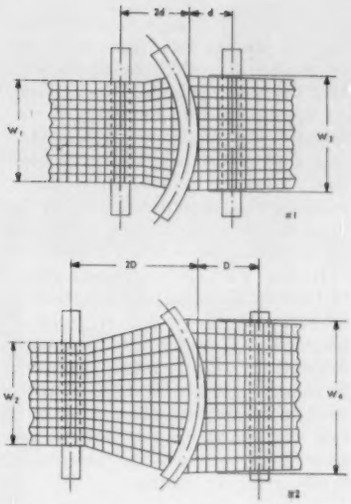


FIG. 3—Mount Hope roll showing spreading action.

$W_1 = W_3$ but because preceding roll in Fig. 1 is closer to the Mount Hope roll than preceding roll in Fig. 2, W_4 is greater than W_2.

The roll preceding the Mount Hope should be far enough away to give maximum expansion, but no more than the radius of the arc that determines the bow of the shaft of the latter. If this radius is exceeded, the felt may be guided back and forth across the machine excessively; and, in extreme cases, it may run off the machine entirely.

The roll following should be placed as close as possible to it. The distance, however, should not exceed half the distance between the preceding roll and the Mount Hope (Fig. 3).

The plane of the bow may be varied from horizontal to oblique up or down (Fig. 4). When the plane is parallel to the travel of the felt, tension across the felt will be uniform. If the plane is tilted into it, the felt will be tightest in the middle, and the guide line will be held back in the middle. Conversely, if the plane is tilted away, the felt will tighten on the edges, and the guide line will go ahead in the middle.

Practical Applications

Perhaps one of the most beneficial uses is to keep the "seam" or guide line of a felt running straight. This has an important bearing on felt life, for a felt that is running cocked will tend to fill up faster. The weave is distorted, the threads are closer together than originally designed, and drainage is impaired. Straightening the "seam" will result in more uniform drainage across the width of the felt. Further, if the guide line is straight and the felt is running at its manufactured length, then it should also be running at proper width.

Another important use is to obtain additional widening of a felt, if so desired, even though the felt is running at its correct manufactured length and width. This type of widening is partly temporary and partly permanent.

Vari-Bow Expanders

Although Vari-Bow expanders and fixed-bow Mount Hope rolls are basically the same in construction and will produce the same operational results, there is one major difference. This is in the construction of the shaft that forms the core of the Mount Hope roll.

The rest of the Vari-Bow expander is similar in construction to the fixed bow Mount Hope roll. The main advantage of the Vari-Bow is that it provides an additional control of the operational effects of the roll on the felt. It is also simpler to use, since it is not necessary to physically move the roll or the adjacent felt carrying rolls to vary the felt expansion.

All the factors regarding theory of operation, roll design and practical application of the fixed-bow roll apply equally to the Vari-Bow expander.

All the factors regarding theory of operation, roll design and practical application of the fixed-bow roll apply equally to the Vari-Bow expander.

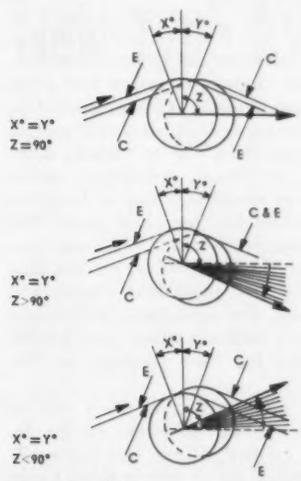

X°=Y°
Z=90°
NORMAL MOUNTING POSITION
CENTER AND EDGES OF WEB TRAVEL EQUAL PATHS. ROLL EXPANDS WITHOUT CORRECTION FOR EDGES OR CENTER.
X°=Y°
Z>90°
TO TIGHTEN EDGES
TURN APEX AWAY FROM WEB TO MAKE EDGE TRAVEL A GREATER DISTANCE THAN CENTER.
X°=Y°
Z<90°
TO TIGHTEN CENTER
TURN APEX INTO WEB TO MAKE CENTER TRAVEL A GREATER DISTANCE THAN EDGES.

FIG. 4—Adjustment of Mount Hope roll to control lateral expansion or contraction.

MOUNT HOPE ROLL used on the felt of a wet machine at a Maine mill.

Suppliers to New Board Mill

Awards of contracts for major equipment items for Fibreboard Paper Products Corp.'s expansion of its kraft pulp and paper board mill at Antioch, Calif., are announced by Bechtel Corp., San Francisco, engineer and constructor.

Pusey & Jones Corp. will furnish the 172-in. (155-in. trim) Fourdrinier machine suitable for all weights of linerboard. Primary and secondary headboxes will be by Valley Iron Works.

Babcock and Wilcox, will build the 600-lb. 715°F. recovery boiler, engineered by C. C. Moore Co., Engineers.

E. D. Jones Co., has been awarded a contract for 800 hp, double disc refiners and 400 hp jordans for refining the base and top liner stock.

Kamyr, Inc., is providing the continuous kraft pulp digester. A modified Swedish design, the 10 ft. diameter, 80 ft. high digester vessel will be used and provides for future addition of a uniform cooling 'diffusion extraction' system. The unit includes latest Kamyr chip-meter, chip feeder, steaming vessel, high pressure feeder and liquor circulating system.

St. Regis 10th International Convention

• Representatives of more than 30 different companies in Europe and South Africa attended the recent 10th Annual International Convention of St. Regis Paper Co. in Monte Carlo, Principality of Monaco.

These international associates of St. Regis met with technical and sales personnel of St. Regis from U. S. A. and Europe to discuss common manufacturing and marketing interests.

Meetings were under direction of Oscar R. Johnson, general manager of St. Regis' international division in New York, and Edgar B. Hoppe, European manager of St. Regis European headquarters in Brussels.

Represented for the first time was Enzo Gutzeit Oy., Finland's largest company, and newest St. Regis associate. Others came from England, Ireland, Scotland, Italy, Spain, Norway, Sweden, France, Austria, Germany, Holland, Greece, and South Africa.

The three-day meeting featured presentations on the engineering, research and marketing phases of the multiwall packaging industry. Hugh W. Sloan, St. Regis vice president, spoke on "The Importance of Marketing." J. H. Clark, of the product development department, reported on market development in Europe. T. A. Hewson, manager of manufacturing operations planning, spoke on "Bag Engineering and the Scientific Approach to New Projects and Operating Problems."

Folke Becker, chairman of the board, Rhinelander Paper Co., Division of St. Regis, reported on "Trends in Paperboard and Packaging in the U. S." O. R. Titchenal, chief engineer, packaging equipment, spoke on "Packaging Engineering."

W. Dingerling, of Natronzellstoff- und Papierfabriken, Goslar, Germany, discussed "New Kinds of Multiwall Packaging Papers."

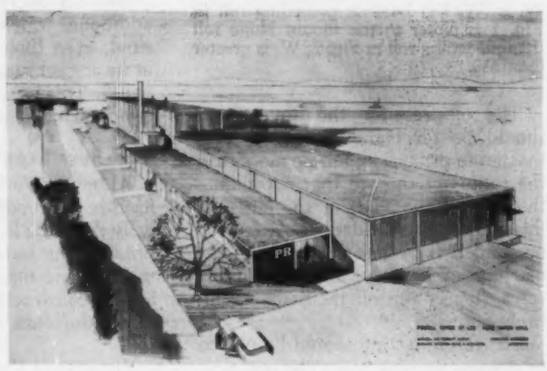
While this was its 10th annual meeting, St. Regis's international business dates back to 1924 when Bates Valve Bag Co. (later acquired by St Regis) set up affiliates in Germany, France, Sweden and England. The company now ships pulp, paper and paperboard to 15 countries outside the U. S. A., manufactures multiwall bags in five areas and has bag-making affiliates in 18 countries.

In line with its continuing growth in both its domestic and international interests, St. Regis has recently announced acquisition of a minority interest in Companhia Industrias Brasileiras Portela S/A, a Brazilian company which supplies paper to its two bag plants there, and a half-interest in a group of box-making plants in South Africa.

Sulfite for Nova Scotia

Sulfite, not sulfate as reported in a story in this publication, will be produced by Nova Scotia Pulp Ltd. at its $40 million bleached pulp mill on the Cape Breton side of the Strait of Canso in Nova Scotia. The 323-acre site area near Point Tupper, on which the mill will be built, will be called Stora Nova Scotia. Daily capacity will be 300 tons of high-grade bleached sulfite pulp. Clearing of the site has already begun. It is probable the mill will use the Stora Kopparberg pulp process.

First of its Kind In West Canada



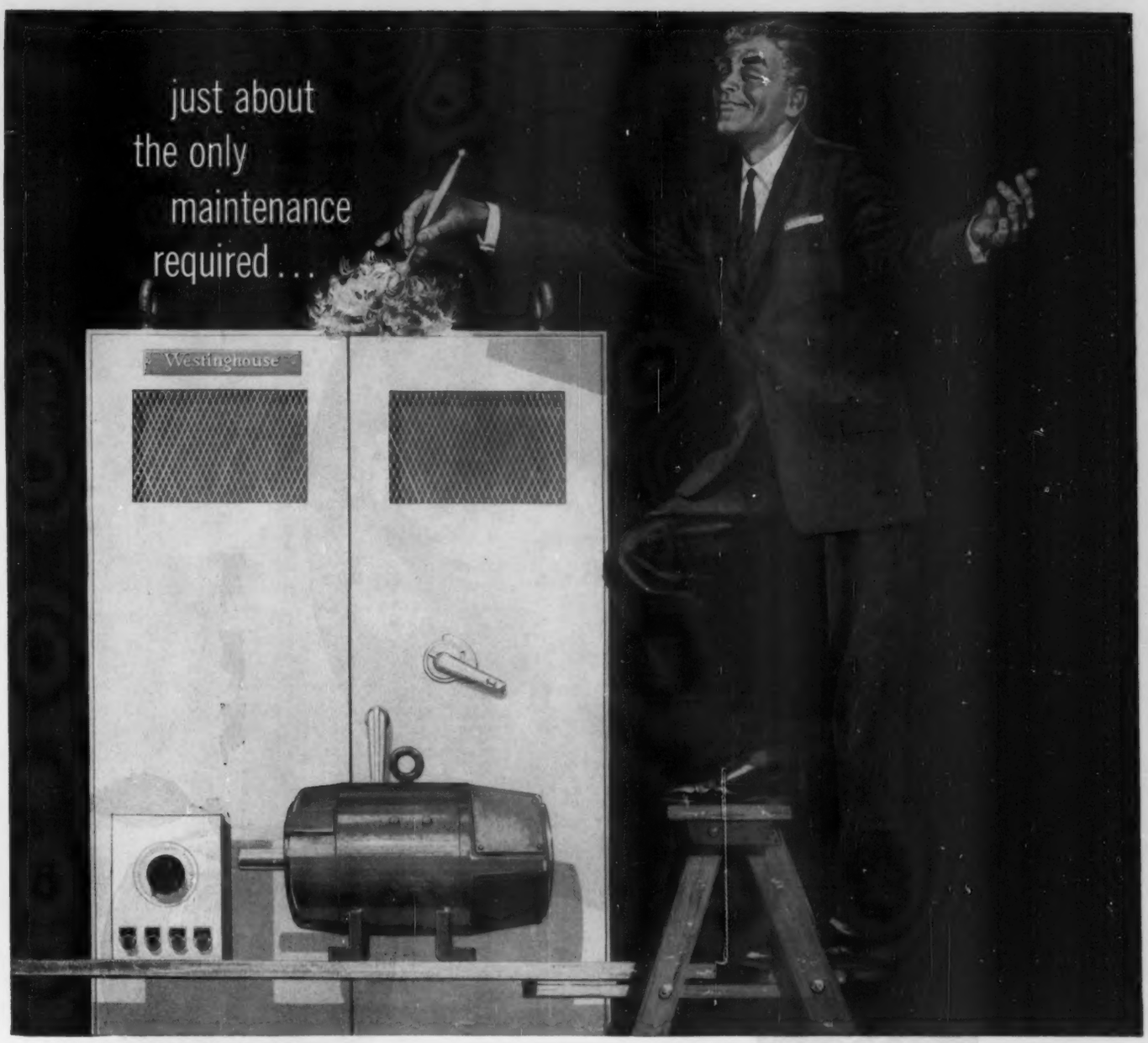
. . . will be this fine paper mill now under construction by Powell River Co. Ltd. on Annacis Is., near New Westminster, B. C. Completion of the $6,000,000 project is set for the summer of 1960. Now being installed is the E. D. Jones preparation system (supplied through Alexander Fleck Ltd.), together with Bauer Bros. Centri-Cleaners and a 120-in. Dominion Engineering Fourdrinier paper machine.

New Converting Plant for Gilman

A modern converting plant of approximately 300,000 sq. ft. will be built in St. Marys, Ga. to house the combined multiwall bag plants, grocery bag plants and other converting operations of the Kraft bag Corp., subsidiary of Gilman Paper Co. Howard Gilman, executive vice president and treasurer, Gilman Paper Co., says the converting plant will receive its paper from the St. Marys Kraft Corp., a Gilman subsidiary, which produces about 800 tpd of bleached and unbleached pulp and paper. The two machine mill produces unbleached kraft papers on one machine and bleached foodboard, coated and uncoated, for conversion into drinking cups, milk containers and flexible packages for food products on the other.

The new converting plant will be served by two sidetracks of the St. Marys railroad, a fully dieselized railroad owned by St. Marys Kraft Corp. Operations are expected to start late 1959.

CENTRALIZED CONVERTING OPERATIONS of Kraft Bag Corp., St. Marys, Ga. will have 300,000 sq. ft. to convert products from sister mill, St. Marys Kraft Corp. when it starts up late in 1959.



New Type AVR static-powered adjustable-speed drive

With the new Westinghouse static-powered AVR adjustable-speed drive, maintenance costs are virtually a thing of the past. Power magnetic amplifiers replace the conventional motor-generator set . . . there are no moving parts to weaken from wear and fail . . . you enjoy all the proven benefits of static control components.

Providing smooth, stepless speed control, new AVR drives are designed for use with motors from 1 to 200 hp . . . give you constant torque over an 8 to 1 speed range, or 10 to 1 with modification . . . are also available with constant-horsepower speed ranges.

New Westinghouse AVR drives are completely engineered, assembled and factory tested. They provide higher operating efficiency with greater reliability than heretofore obtainable from conventional drives. They simplify installation and reduce floor space required . . . sometimes as much as one-half the area of conventional M-G set drives.

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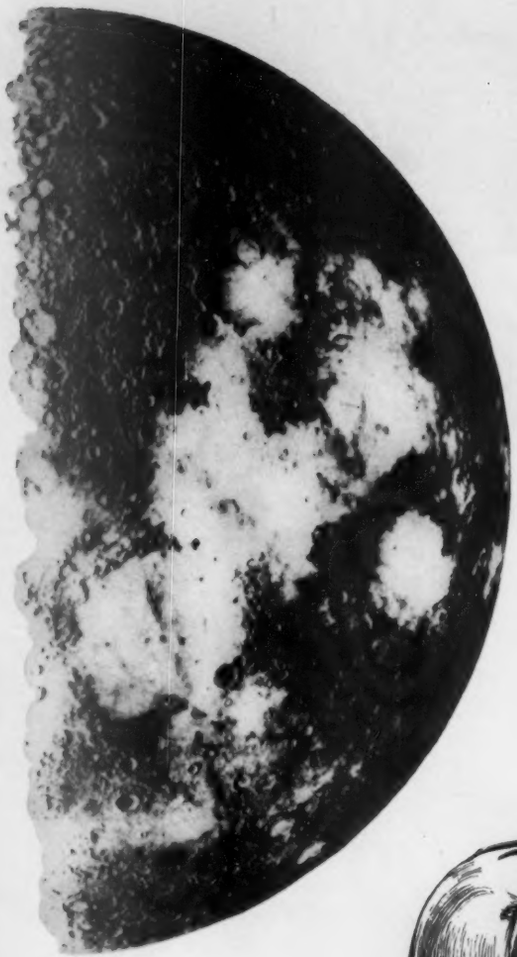

$f = Gm_1m_2/r^2$

SIR ISAAC NEWTON—mathematician . . . physicist . . . author . . . parliamentarian—was one of the world's most versatile men. Among the first to chart the movement of the planets, he also formulated the Law of Gravity and wrote classic scientific treatises still read today. His genius expressed itself in many ways. ALBERTA HI-BRITE® bleached kraft pulp—endowed with properties of strength . . . formation . . . brightness . . . cleanliness . . . is the world's most **VERSATILE** pulp. Alone or in blended furnishes, it can help perfect the quality of nearly every grade of white paper made.

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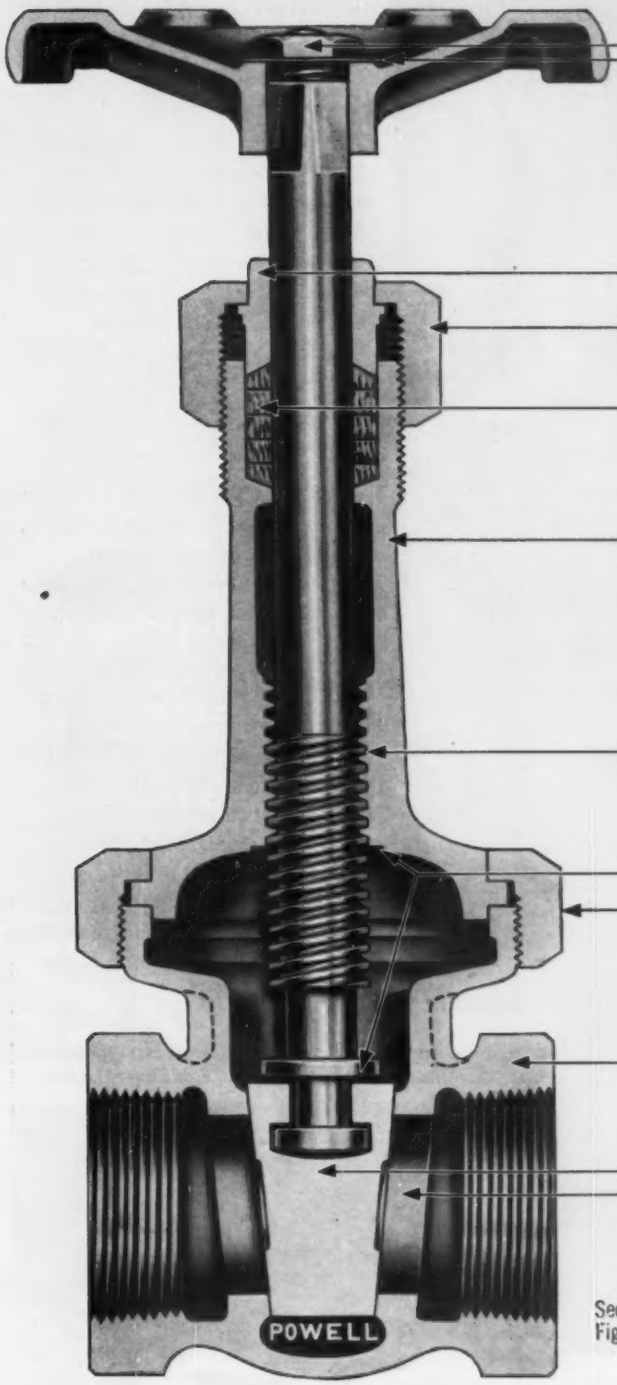
for 125 and 150 pounds WSP

Powell's new BRONZE Union Bonnet Gate Valves have many superior features — some of which are outlined here. For complete details, write us for new illustrated circular. Or check with your nearest Powell Valve distributor. Always look to Powell first for all your valve needs.



Handwheel Nut—securely holds malleable iron, non-heating handwheel to the stem.

Identification Plate—gives Figure Number and kind of valve.

Protruding Packing Gland—a Powell feature—compresses the packing, offers additional guidance to the stem, and prevents packing nut from becoming loose and rotating with stem.

Heavy Hexagonal Packing Nut—for holding gland and adjusting packing.

Deep Stuffing Box—holds more than ample amount of high-grade steam packing.

Long Bonnet—cast of high tensile bronze for long service.

Stem—is high tensile bronze, extra heavy, of large diameter, with long Acme threaded section.

Repack-Under-Pressure Seat and Collar—permit valve to be repacked under pressure when fully open.

Octagonal Ring Nut—is deep threaded and tightly holds body-bonnet connection. Affords additional wrenching positions.

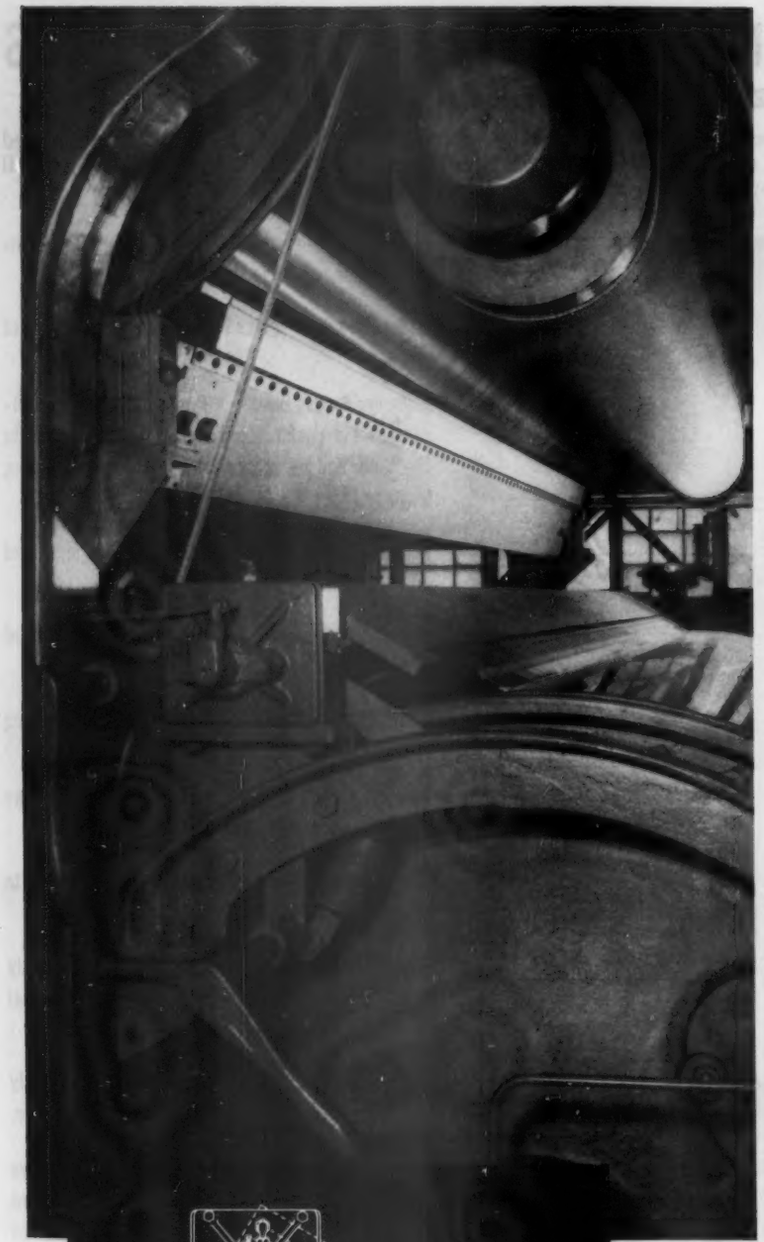
Body—a high tensile bronze casting, scientifically designed to provide full flow area through the valve.

Wedges—Interchangeable Solid or Double Wedges are available in rising stem valves. They are held to stem by a "T" slot, and are accurately guided to valve seats by means of integral cast lugs that travel in female guideways in the valve body. Entirely clearing the waterway, full unobstructed flow through is assured.

Ample Space—between seats and end of pipe thread prevents injury to seats when screwing pipe into the body.

Sectional—Union Bonnet Rising Stem Gate Valve
Fig. 2700 (125 pounds), Fig. 2714 (150 pounds).

THE WM. POWELL COMPANY • *Dependable Valves Since 1846* • **Cincinnati 22, Ohio**

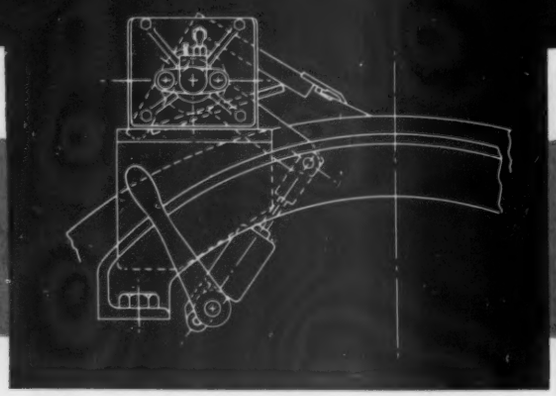


No wonder– they're Lodding Doctors!

DRYER ROLLS at the Chillicothe Paper Company run clean — free of the insulation that baked-on fibers create. This contributes to operating efficiency in the dryer section, resulting in high quality, economical, safe production. Lodding Doctors are largely responsible. Other rolls at Chillicothe run clean, too, and for the same reason.

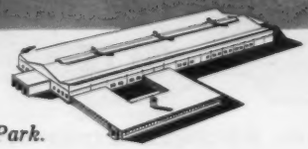
Whether for the dryers or any other rolls from the Fourdrinier to the reel, Lodding Doctors contribute to operating efficiency by helping to keep rolls clean and preventing wraps.

You can depend upon this kind of performance with Lodding Doctors, because each is custom engineered for the specific roll on which it is to be installed and is made by specialists according to the highest standards of precision craftsmanship. This is why Lodding Doctors are guaranteed to give satisfactory performance.

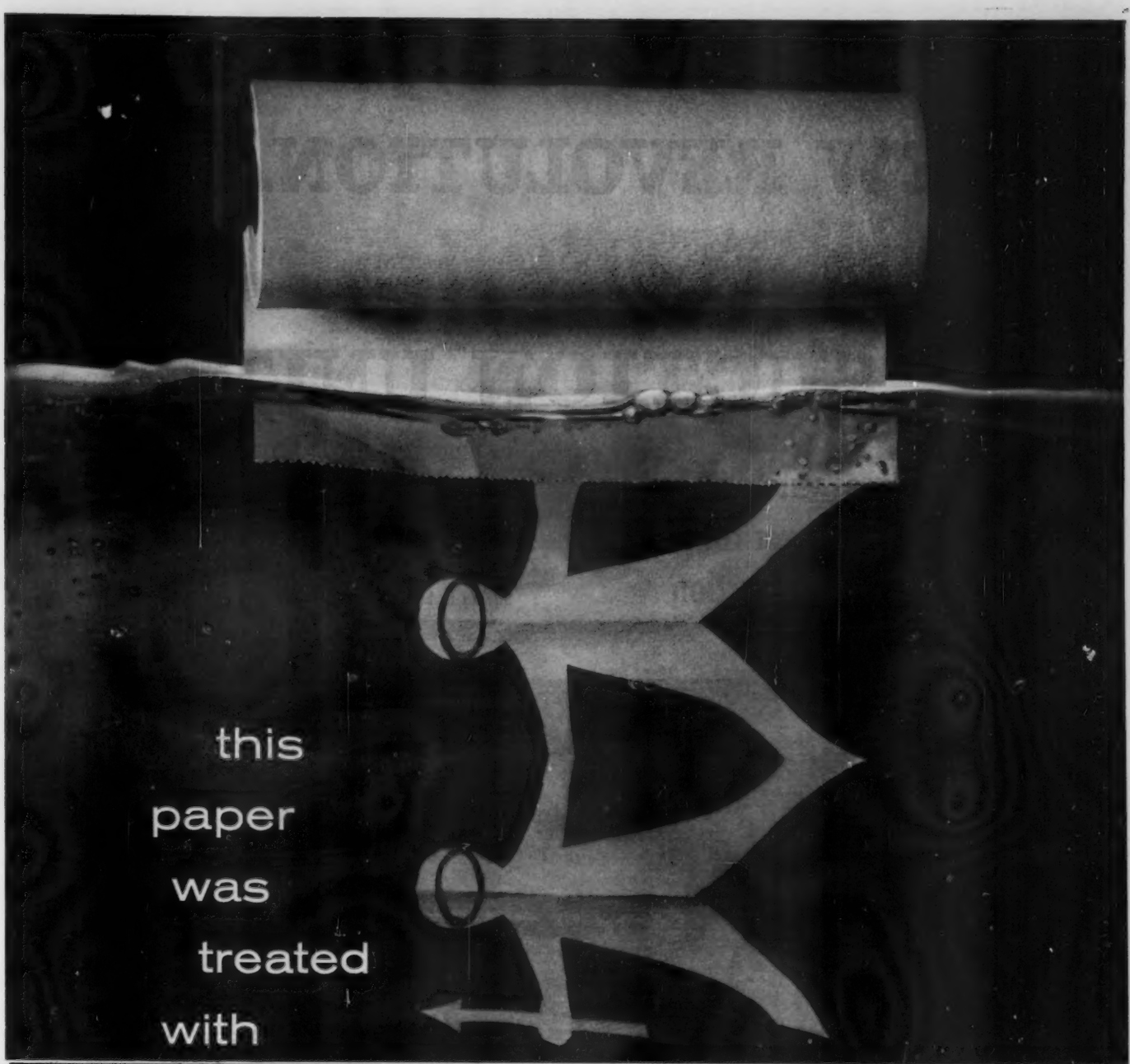


For the assurance of maximum doctoring efficiency on your machine rolls, specify Lodding Doctors.

LODDING
Engineering Corporation
AUBURN, MASSACHUSETTS



We welcome your inspection of our new plant located in Worcester's Auburn Industrial Park.



SCRIPTITE* 40

Scriptite 40, a new concept in urea-formaldehyde paper resins, imparts high off-machine wet strength with less resin add-on. Made more cationic, this water-soluble resin is strongly attracted to the cellulose, assuring greater application efficiency. Formulated for fast cure, Scriptite 40 also improves dry tensile strength, dry mullen, wet rub resistance, dimensional stability, and folding endurance. For samples and technical data, write: Monsanto Chemical Company, Plastics Division, Room 1111, Springfield 2, Mass.

Monsanto

*SCRIPTITE, LYTRON: Reg. U.S. Pat. Off.

The Monsanto line of paper resins also includes

SCRIPTITE 54 *outstanding water resistance, both wet and dry rub resistance.* **SCRIPTITE 55** *a low viscosity resin for improved water resistance, wet and dry rub resistance with easy handling.* **SCRIPTITE 52** *in combination with formaldehyde, gives water resistance to folding boxboard and jute liner.* **SCRIPTITE 50** *unsurpassed printability, improved surface characteristics on boxboard.* **SCRIPTITE 33** *melamine wet-strength resin.* **SCRIPTITE 45** *new thermosetting resin for stabilization of paper.* **LYTRON*** *water dispersal resin polymers for coatings.*

NEW REVOLUTIONARY

High Speed **ROTABELT**

REGD. TRADE MARK

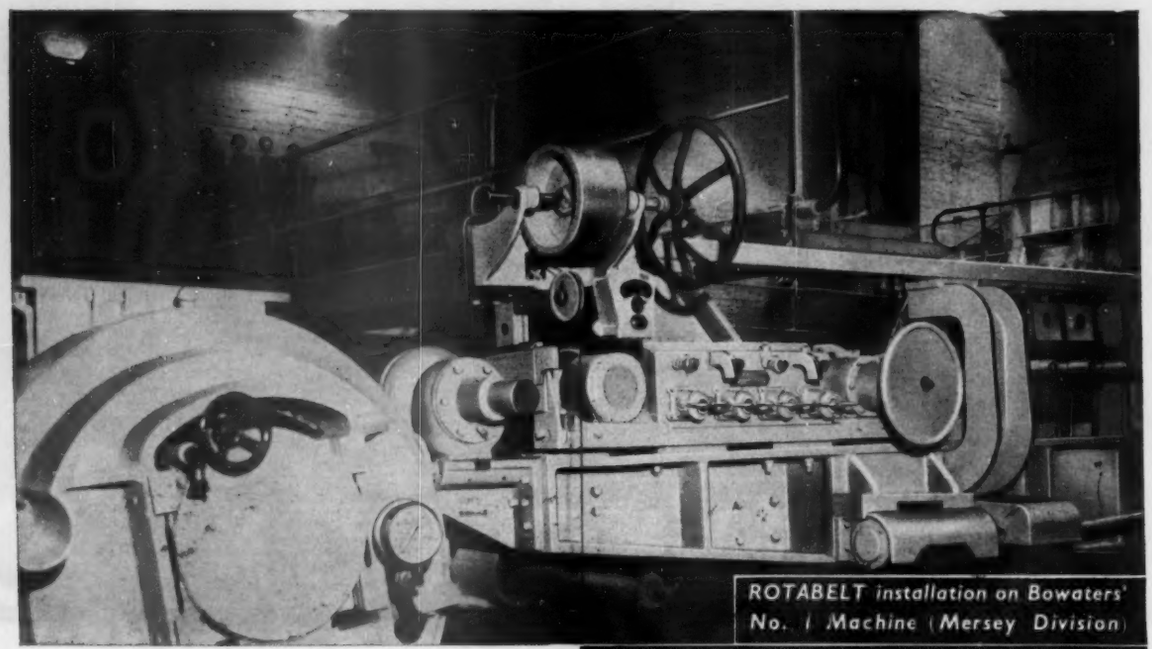
SUCTION UNIT

- increases wire and felt life
- reduces power consumption
- increases production

REPORT FROM BOWATERS

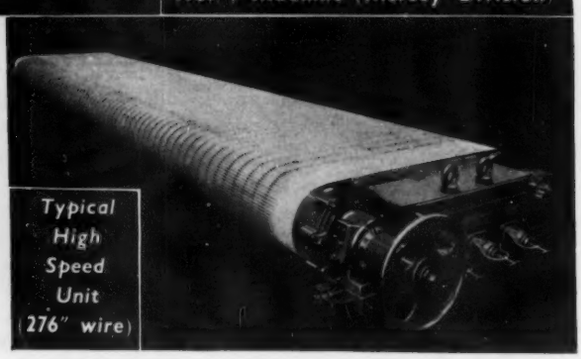
after more than twelve months in operation:

1 Wire life has more than doubled.
2 Couch drive load reduced by 31%.
3 Saving in Labor Cost by fewer wire changes.



ROTABELT installation on Bowaters' No. 1 Machine (Mersey Division)

BOWATERS' REPORT: *"We can say after running for one year the ROTABELT has proved to be an outstanding success."*



Typical High Speed Unit (276" wire)

W. P. EVANS & SON LTD

Papermakers' Engineers

NASHUA, NEW HAMPSHIRE, U.S.A.

Telephone: TUxedo 2-9081

Here's proof of economy with FALK Shaft Mounted Drives

PROBLEM—For many years, a prominent Eastern abrasives manufacturer* experienced high maintenance and down-time costs, as well as excessive noise and vibration, in the operation of 19 pebble mills driven by open spur gears. Drive gears and jack shaft pillow blocks required frequent repairs or replacement, and trunnion shafts often failed, due to radial overloading of the bull gear when broken pinion teeth bottomed between gear teeth.

SOLUTION—After numerous unsuccessful approaches to these problems, the solution was found by mounting a Size 315J FALK Shaft Mounted Drive directly on the mill drive trunnion. This eliminated objectionable gear noise and vibration...greatly reduced costly down-time and loss of production...and cut annual maintenance and replacement expenses as indicated by the following figures taken from the customer's records:

Spur Gear-and-Pinion Drive		FALK Shaft Mounted Drive	
Bull Gears	$ 56	VEE Belts	$ 30
Pinions	120	FALK Shaft Mounted Drive (based on 10-year life)	70
Pillow Blocks	90		
VEE Belts	30		
Trunnion (5-year life)	100		
Annual cost	$396	Annual cost	$100
		ANNUAL SAVINGS	$296

IF OBSOLETE DRIVES ARE COSTING YOU MONEY, a change to Falk All-Steel Shaft Mounted Drives can effect important savings in money and production. Used on almost any type of machine, these compact, rugged units are establishing new standards of economy and efficiency in many industries. Specify FALK Drives on your purchased equipment...For full details, **write for Bulletin 7100.**

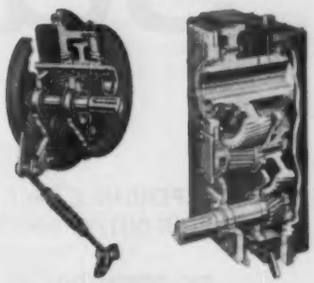
*Name on request

THE FALK CORPORATION, MILWAUKEE 1, WISCONSIN

MANUFACTURERS OF QUALITY GEAR DRIVES AND FLEXIBLE SHAFT COUPLINGS

Representatives and Distributors in Most Principal Cities

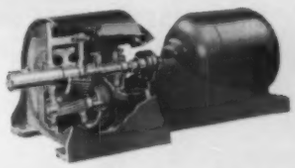
To get the right drive for your application, specify FALK®



SHAFT MOUNTED DRIVES

Horizontal or vertical units—½ to 50 hp—420 to 5 rpm—single and two double reduction ratios—output torque ratings up to 41,000 lb-in (consult factory for higher torque capacity).

• • •



ALL-MOTOR® MOTOREDUCERS

Sizes up to 75 hp—furnished with or without standard foot-mounted motor—standard output speeds 1.2 to 520 rpm (with 1750 rpm motors)—ratios as high as 54,000:1 in semi-standard designs. Integral units (gearmotor type) also available. Ask for **Bulletin 3100.**

• • •

FALK Drives are available from factory and distributor stocks from coast to coast. Consult your Falk Representative or Distributor.

FALK

...a good name in industry

What it means to be the world's largest producer of salt cake

DEPENDABLE YEAR-IN, YEAR-OUT, PRODUCTION

BIG INVENTORY OF HIGH PURITY FINISHED PRODUCT

BRINE RESERVES FOR GENERATIONS TO COME

FAST DELIVERY OF ANY QUANTITY, ANY TIME, ANYWHERE

TRONA* is in a class by itself as the world's largest producer of Sodium Sulphate for the pulp and paper industry and other important chemical markets. Big tonnage production, backed up by huge brine reserves on Searles Lake, means the ability to stockpile large inventories of high purity finished product. Constant movement of carload shipments to all major consuming areas means that cars can be rerouted at any time to take care of emergency needs. These advantages add up to the kind of service that buyers of Salt Cake can depend on. Make TRONA *your* prime source of supply... it pays!

Look for an early announcement of the start-up of American Potash & Chemical Corporation's new sodium chlorate plant at Aberdeen, Mississippi, constructed to supply the rapidly growing southern pulp and paper industry.

TRONA

*TRADENAME AND TRADEMARK OF AP&CC

American Potash & Chemical Corporation

3000 WEST SIXTH STREET, LOS ANGELES 54, CALIFORNIA

OFFICES: LOS ANGELES, NEW YORK, CHICAGO, SAN FRANCISCO, PORTLAND (ORE.), ATLANTA, COLUMBUS (O.), SHREVEPORT

Producers of: BORAX • POTASH • SODA ASH • SALT CAKE • LITHIUM • BROMINE • CHLORATES • PERCHLORATES • MANGANESE DIOXIDE
THORIUM • CERIUM • RARE EARTHS • *and other diversified chemicals for Industry and Agriculture*

RYKON *Grease*

passed this test at Corn Products Company

Situation: The springs in the grease chargers on expeller machines at Corn Products Company's Argo, Illinois, plant are under extra heavy tension. Due to this tension, oil formerly separated from the grease thickener in the grease cups. Bearings did not receive proper lubrication and the cups filled with grease thickener residue. The system needed cleaning every three months. Each time, large amounts of residue were found. Ten special-purpose greases were tried in an effort to solve the problem.

What was done: A Standard Oil lubrication specialist working with Corn Products' plant maintenance people recommended RYKON Grease #2 E.P. The system now needs cleaning only every six to nine months. Very little residue is found. Now RYKON Grease has become one of the important lubricating greases in use at Corn Products' Argo plant.

RYKON Grease is formulated with a unique non-soap organic thickener. The fibers of this thickener hold RYKON's fine quality base oil firmly in suspension. The grease resists water washing, high temperature and dirt contamination while providing superior lubrication to bearings of all types.

What you can do: Get more facts about RYKON Grease from the Standard Oil office nearest you anywhere in the 15 Midwest and Rocky Mountain states. Or write **Standard Oil Company (Indiana), 910 S. Michigan Ave., Chicago 80, Ill.**

You expect more from **STANDARD** *and you get it!*

Standard's Arnold Parus and chief lubrication foreman Henry Anderson take a look at expeller unit's grease system. Arnold Parus is well equipped through experience and training to work with plant men on lubrication problems. Arnold has a B.S. degree from Bradley University and three years' field experience in this kind of work. He has also completed Standard's Sales Engineering School.

Quick facts about **RYKON** *Grease*

- Heat stable. At sustained high temperatures, RYKON Grease remains soft and grease-like.
- Resistant to water washing.
- Mechanically stable. Minimum change in consistency in service.
- Resistant to oxidation. Thickener acts as inhibitor.
- Exceptional rust preventive properties.

A SKILLED HAND IN CHEMISTRY . . . AT WORK FOR YOU

NOPCOSANT®

...for pitch dispersing

...for slime control

...for size stabilizing

...for coating fluidizing

...for uniform dyeing

You will find it worth your while to get all the facts about Nopcosant—Nopco's newly improved dispersant and solubilizer. Ask your Nopco representative or write for complete information. Remember, too, back of every chemical made by Nopco for the paper industry stands Nopco Technical Service—an experienced staff ready to assist with laboratory data and recommendations based upon your specific requirements.

Properties of NOPCOSANT

A fine powder of uniform particle size

★

Dusts less than any other similar product

★

Lightest colored product of its type

★

One of the most rapidly dissolving products available

★

Most nearly natural *p*H in its chemical class

NOPCO CHEMICAL COMPANY
60 Park Place • Newark, N.J.

NOPCO®

Plants:
Harrison, N.J. • Richmond, Calif. • Cedartown, Ga. • London, Canada

USCOWELD PLASTIC PIPE FITTINGS

Greater Joint Strength—Faster Insertion—Thanks to

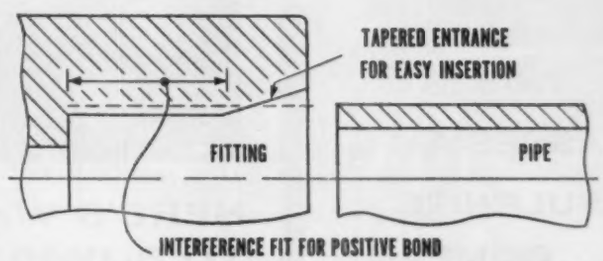
THE ONLY SOLVENT-WELD FITTING WITH AN INTERFERENCE FIT!

To get maximum joint strength, interference fit is a must! UscoWeld fittings are designed to provide at least a .005 inch *interference fit*. And UscoWeld fittings are a cinch to install because of a specially designed *tapered entrance socket*. U.S. Rubber has developed the unique UscoWeld fitting of the same tough, lightweight, corrosion-resistant thermoplastic as famous Uscolite® CP plastic pipe.

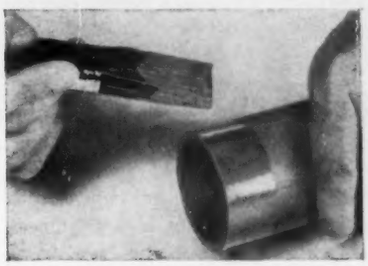
All UscoWeld fittings can safely handle the pressures recommended for the corresponding size of extra-heavy Uscolite pipe. Maximum recommended operating temperature is 170°F. Pipe can be cut to exact length, is easily installed in close quarters.

UscoWeld*—plus the most complete line of plastic pipe and fittings in America—is obtainable through your local "U.S." Distributor, any "U.S." Branch, or write us at Rockefeller Center, New York 20, N. Y. In Canada: Dominion Rubber Co., Ltd. *Patent applied for

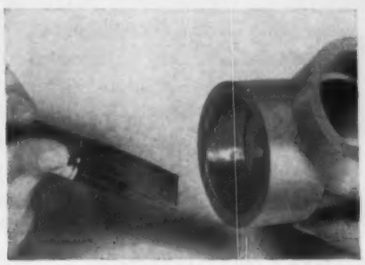
THE USCOWELD PRINCIPLE



By combining tapered entrance socket and a .005 inch interference fit—even when the pipe is at the small limit of the diameter tolerance and the fitting at the large limit of its diameter tolerance—UscoWeld is easily installed, and the strongest solvent-weld joint available.



Apply Uscolite CP cement to the outside area of the pipe that is to be in contact with the socket.



Next apply cement uniformly to entire inside area of *tapered entrance* socket.

While both cemented surfaces are still wet, insert pipe in fitting and push until pipe bottoms against shoulder in the fitting.

ADVANTAGES

- fast, easy to assemble—tapered entrance provides easy insertion of pipe
- strong joint—interference fit provides for optimum fusion of pipe and fitting into homogeneous mass; joint strength not dependent on cement alone
- automatic alignment of pipe and fittings
- chemical resistance of the UscoWeld joint is the same as for Uscolite pipe
- UscoWeld takes maximum advantage of the inherent "solvent-weldability" of plastic pipe and fittings
- no threading required—just cut pipe square
- not necessary to allow for thread make-up variation—pipe can be cut to exact lengths
- easy to install in close quarters
- resists fatigue due to vibration or thermal stresses by elimination of stress concentration at thread roots.

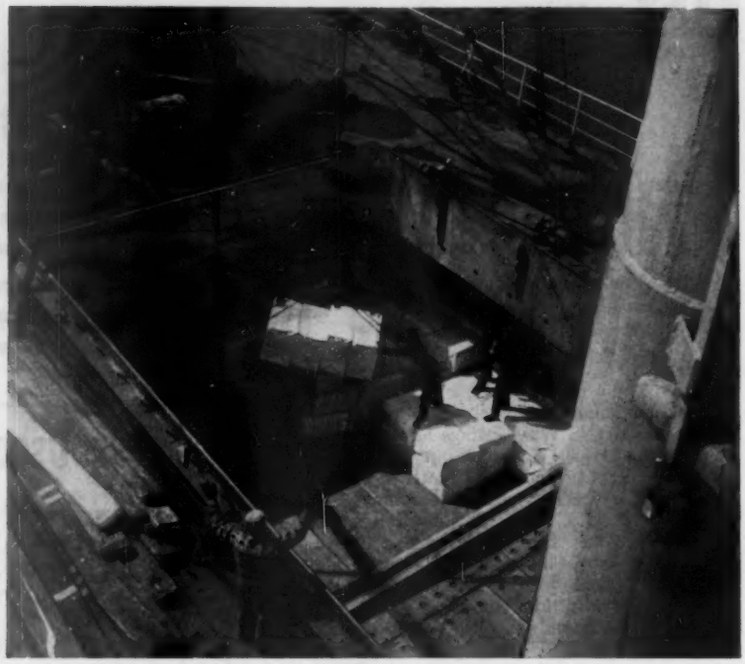
Mechanical Goods Division

United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y. In Canada: Dominion Rubber Company, Ltd.

BALES OF GASPESIA BLEACHED SULPHITE PULP for export are loaded into the hold of a 10,000-ton ocean-going vessel.



THIS IS GASPESIA SULPHITE COMPANY

HERE'S WHY IT WILL PAY YOU TO BUY PULP FROM GASPESIA

At Gaspesia we enjoy many natural advantages. Northern spruce and balsam fir—slow-growing, long-fibered, best for sulphite pulp—are the sole sources of the pulp you receive from us. Our access to nearly a million acres of these fine trees assures you a dependable, top-quality supply.

Gaspesia's continuous flow bleaching, regulated by the most advanced control methods, applies automation to every possible operation. Uniform quality —so vital to your finished product—results from Gaspesia's superior equipment, operated by men who have spent lifetimes acquiring the "feel" of pulp making. They confidently urge you to try our pulps.

Gaspesia pulp has earned endorsement for many uses—*from papeteries to boxboard to tissues*. Among its characteristics: high opacity, high brightness, good strength, excellent bulk and trouble-free working properties.

Location on the Gaspé Coast, within easy reach of waterways to the whole world, affords low-cost water transportation, practically ice-free, to nearly every major market area. Shipping time to Europe is about half that from our Pacific Coast. Transcontinental rail systems speedily deliver carload quantities to both the United States and Canadian markets.

Have you tried Gaspesia?

GASPESIA SULPHITE COMPANY LTD.
CHANDLER, QUEBEC, CANADA

SOLD BY: **Anglo Paper Products, Ltd.**
2055 Peel Street, Montreal 2, Quebec
67 Yonge Street, Toronto 1, Ontario

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400 Madison Avenue, New York 17, N.Y.
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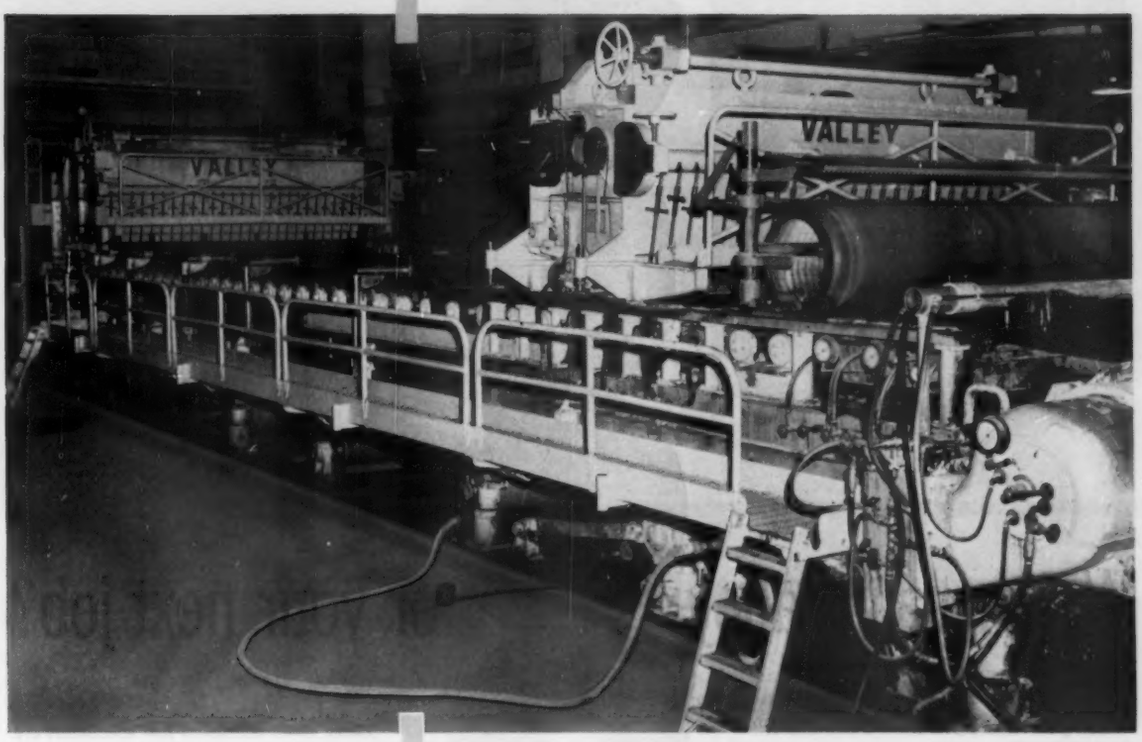
STILL
NOTHING ELSE LIKE IT . . . IN HEADBOX PERFORMANCE



Wide Range Versatility
Uniform Profile
Formation
Flexibility
Runability

Consult...

VALLEY IRON WORKS COMPANY

APPLETON, WISCONSIN

Which valve alloy for your next job?

When you next have a requirement for high alloy valves, especially for corrosion service, why not come to the company with the most experience in this field.

Aloyco has specialized in the manufacture of stainless steel valves, exclusively, for over 30 years.

We have accumulated a wealth of know-how, not only on how to engineer valves for hard-to-handle corrosives, but also on what alloys are the most efficient and will give the longest life.

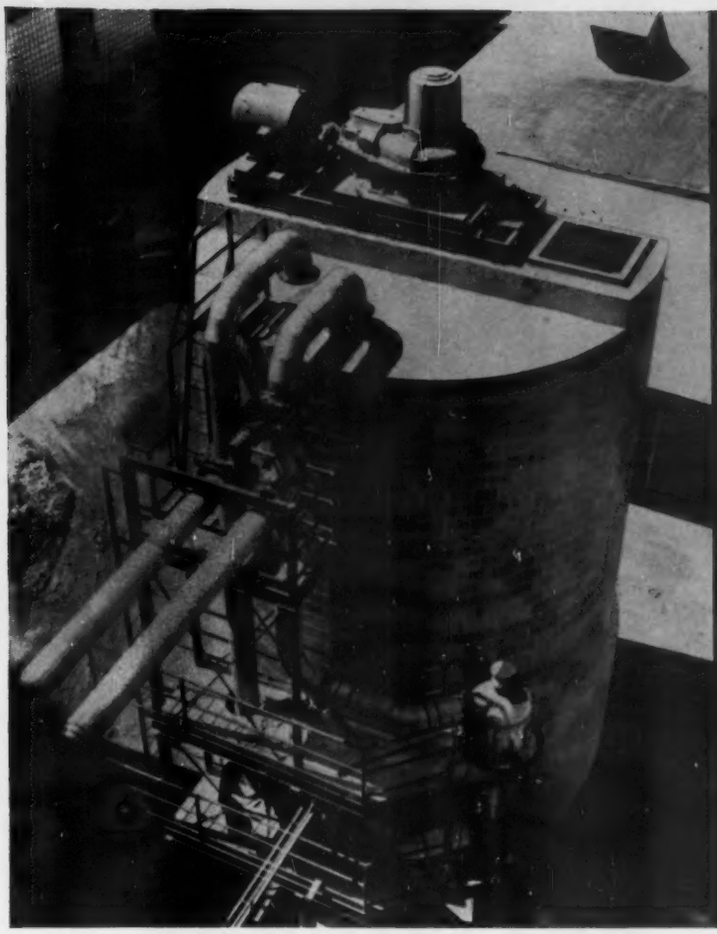
Aloyco's field consulting service is yours for the asking. Why not write or call our nearest sales office for help on your next alloy valve job. Alloy Steel Products Company, 1316 West Elizabeth Avenue, Linden, New Jersey. e.10

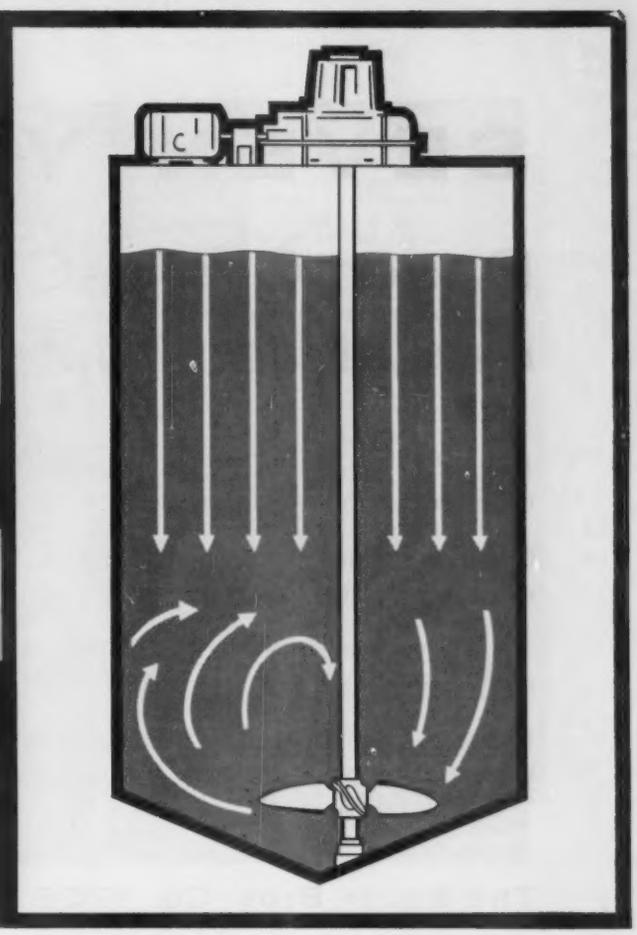
Offices in: Boston • New York • Wilmington Atlanta • Buffalo • Pittsburgh • Chicago St. Louis • San Francisco • Los Angeles

***These seven corrosion test specimens** are just a few from hundreds of tests conducted by Aloyco to insure our valve customers of the right alloy for their particular job. Aloyco valves are supplied in such metals as 304 and 316 stainless steel, Aloyco 20, Nickel, Monel and Hastelloy B, C and D.*

Longer Lasting
ALOYCO
VALVES
1ST IN CORROSIVE SERVICE

ALLOY STEEL PRODUCTS COMPANY
LINDEN, N. J.





How to spot a stock fluctuation before it happens

Engineers have found a fast, sure new way to get stock ready for its trip through St. Regis Paper Company's big mill at Pensacola, Fla.

Heavy stock—averaging 6%—moves out of this storage chest at a consistency that's uniform and *known in advance.*

There are no sudden up-and-down swings. Feed stock fluctuations that occur are smoothed out—end result is a fully predictable effluent. Thus it's easier for mill engineers to control the entire highly automated circuit through which the stock flows on its way to the machine.

How does it work? Sitting on top of the chest is a LIGHTNIN Mixer that develops 200 horsepower. A steel shaft reaches 28 feet down into the chest's cone bottom, where a fast-turning 8-foot diameter propeller gives the heavy stock a powerful churning.

Mixing takes place in a sharply-defined zone in the bottom third of the unbaffled chest. Within this controlled zone, stock is fully uniform. Above the agitated zone, stock is relatively motionless, but it moves in a definite plug-like flow into the agitated zone as mixed stock is drawn off. Time cycle and flow path of all stock—mixed and unmixed—are completely predictable.

How you can apply it. Wherever you want uniform stock to help your mill system run efficiently, you can get it with LIGHTNIN Mixers in your chests or tanks.

You get the precise power level you need to accomplish the job you want done within a given time. Results are guaranteed.

To get the facts on this tight-control stock mixing method, now working effectively in more than 100 mills, call in your LIGHTNIN Mixer representative (listed in Thomas' Register). Or write us today.

Lightnin® Mixers™

MIXCO fluid mixing specialists

Ask for these illustrated bulletins describing LIGHTNIN Mixers:

- ☐ Laboratory and small-batch production types (B-112)
- ☐ Top or bottom entering; turbine, paddle, and propeller types: 1 to 500 HP (B-102)
- ☐ Top entering; propeller types: ¼ to 3 HP (B-103)
- ☐ Side entering: 1 to 25 HP (B-104)
- ☐ Portable: ⅛ to 3 HP (B-108)
- ☐ Condensed catalog showing all types (B-109)
- ☐ Quick-change rotary mechanical seals for pressure and vacuum mixing (B-111)
- ☐ Data sheet for figuring general mixer requirements (B-107)

Check, clip and mail with your name, title, company address to:

MIXING EQUIPMENT Co., Inc., 141-J Mt. Read Blvd., Rochester 3, N.Y.

In Canada: Greey Mixing Equipment, Ltd., 100 Miranda Ave., Toronto 19, Ont.

SEVEN YEARS AGO

Bauer Centri-Cleaners introduced new ideas about making clean paper

Imitated in appearance but never equalled in efficiency and length of service—that's the story of Bauer Centri-Cleaners since their first installation in 1952.

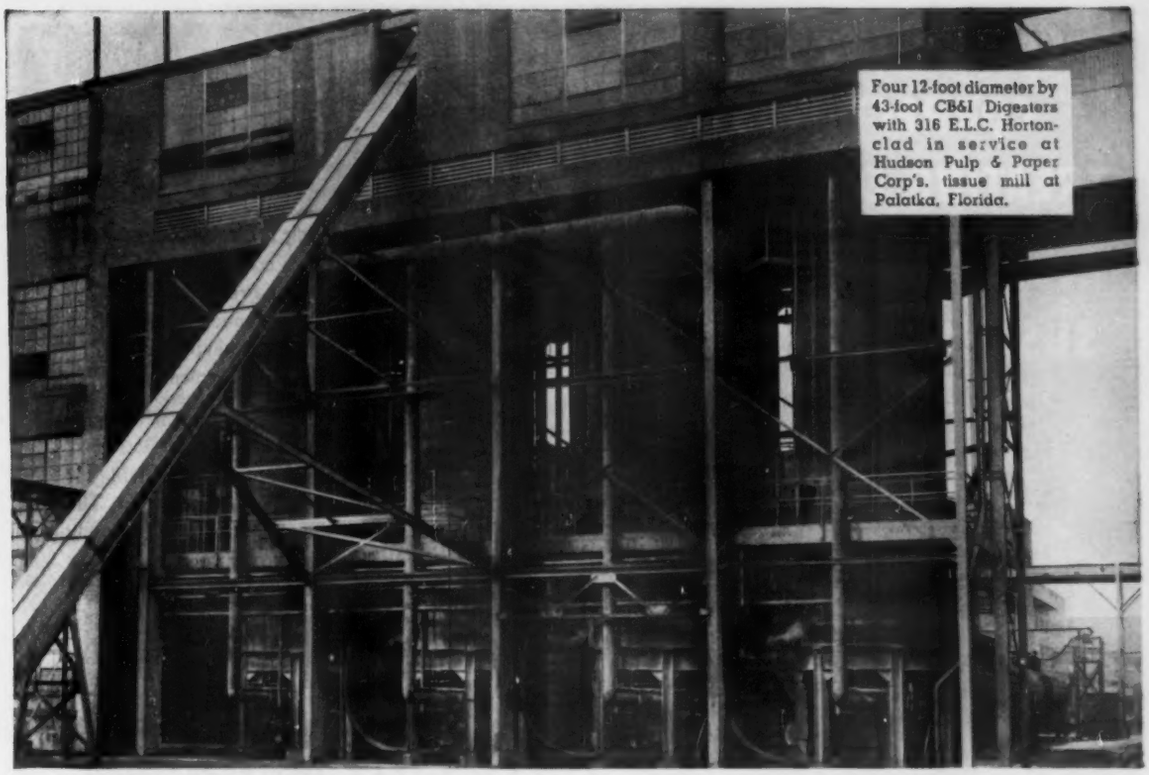
Cleanliness figures from hundreds of mills, plus results from tough, impartial tests on all kinds of pulp, prove their value in cleaning pulp and furnish to the highest degree possible.

The many original installations still in use attest to the durability and know-how built into every unit.

If cleaner paper or board is your aim, ask the Bauer man about the Centri-Cleaner best for your needs. For a quick glance at our complete line, ask for Bulletin P-4-D.

The Bauer Bros. Co., 1706 Sheridan Ave., Springfield, Ohio

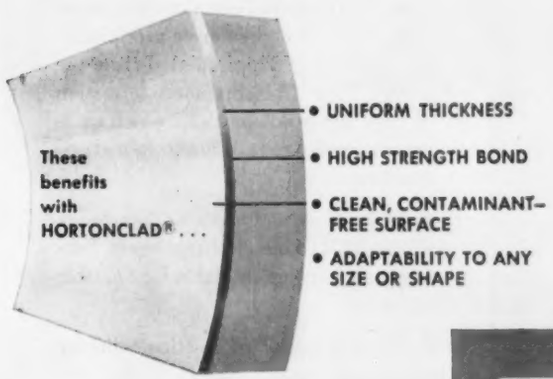
This No. 600 Centri-Cleaner is from one of the original installations and still shows no sign of wear.



Four 12-foot diameter by 43-foot CB&I Digesters with 316 E.L.C. Hortonclad in service at Hudson Pulp & Paper Corp's. tissue mill at Palatka, Florida.

HORTONCLAD®

better corrosion protection for clad vessels with high vacuum brazing process


These benefits with HORTONCLAD® . . .
• UNIFORM THICKNESS
• HIGH STRENGTH BOND
• CLEAN, CONTAMINANT–FREE SURFACE
• ADAPTABILITY TO ANY SIZE OR SHAPE

Hortonclad, available only in CB&I tanks, pressure vessels and other clad structures, is unlike other clad materials. The bond is accomplished by a flux-free high vacuum brazing process producing a clad plate with an integral and continuous bond of high strength. Uniform clad thickness results as both alloy cladding and backing are in their final thickness *before* bonding. Silver, stainless steels (both chromium and chromium nickel) nickel, and high nickel alloys such as Monel, Inconel, and Hastelloys B and F can be employed in the Hortonclad process.

In corrosive service, Hortonclad permits the use of higher temperatures, concentration and pressures —without the high cost of solid alloy vessels. For further information on its application, write our nearest office . . . ask for the *Hortonclad* bulletin.

CBI

Chicago Bridge & Iron Company

Atlanta • Birmingham • Boston • Chicago • Cleveland • Detroit • Houston
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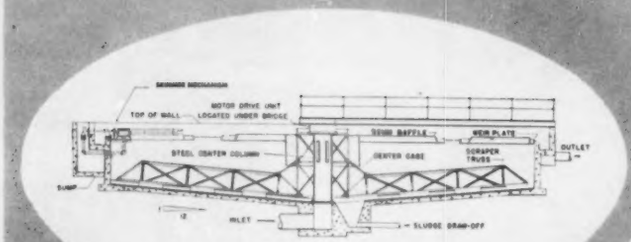
San Francisco • Seattle • South Pasadena • Tulsa
Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY and GREENVILLE, PA.

FP-20

Choose the CORRECT WASTE TREATING EQUIPMENT for SUSPENDED SOLIDS REMOVAL



If you require only settleable solids removal you'll do well to consider an INFILCO clarifier for simple gravity settling. Correct hydraulic and mechanical design insures satisfactory performance and minimum maintenance expense.

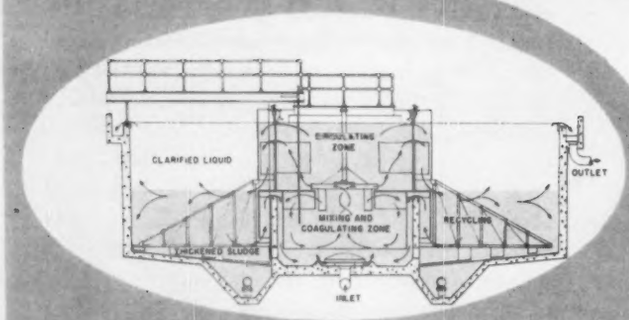
The WS Clarifier mechanism with a central drive shaft supported from stationary beams spanning the tank is available for small and medium diameter units. The BF mechanism with the scraper assembly suspended from a turn-table carried by a central column is preferred for larger size clarifiers.

Surface skimmers are available for floatable solids.

For complete information, send for

Bulletin W-800-D

Minimize your investment by selecting the correct equipment to accomplish the results you want



If pollution control regulations or your plans for water recovery require colloidal as well as settleable solids removal by chemical coagulation, specify the CYCLATOR® clarifier to obtain unique design features which give you maximum clarification.

Untreated waste and chemicals are mixed in the presence of previously precipitated solids which are recirculated from the settling zone. This promotes formation of large dense floc particles which settle rapidly and produce maximum clarification.

Bottom scrapers thicken settled sludge and move it to the discharge sump. Surface skimmers are available for floatable solids.

For more complete information, write for

Bulletin 850-C

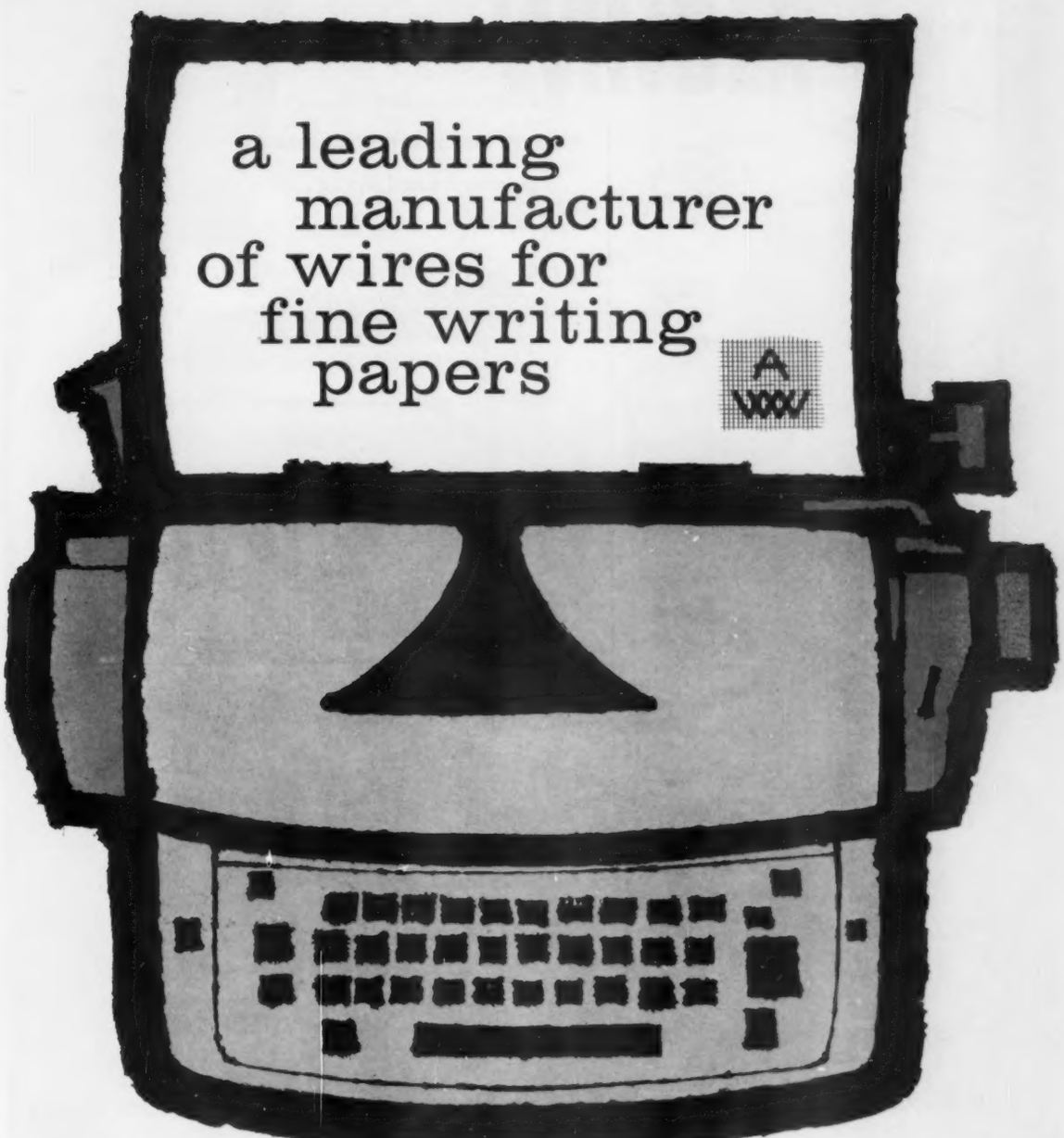
INFILCO

INFILCO Incorporated

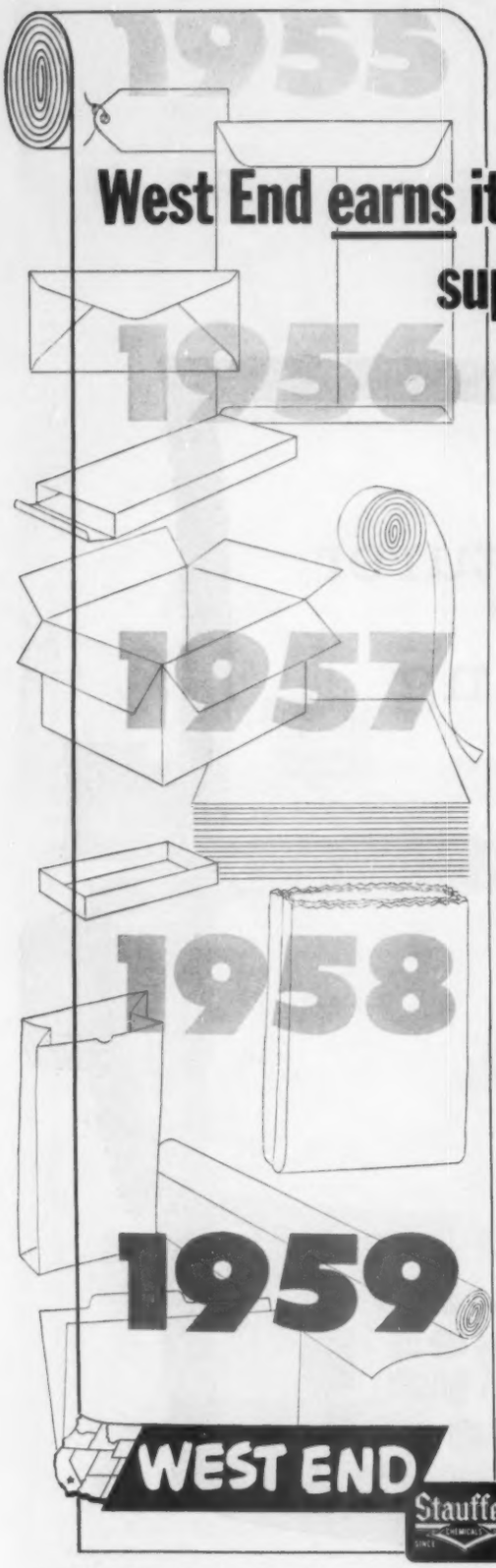
General offices • Tucson, Arizona

Field offices throughout the United States and other countries

APPLETON
WIRES
ARE
GOOD
WIRES

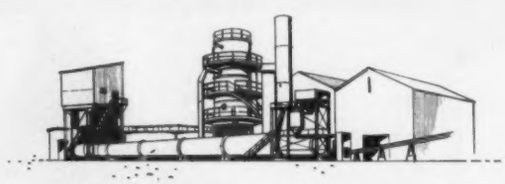


APPLETON WIRE WORKS CORP., PLANTS AT APPLETON, WIS. AND MONTGOMERY, ALA.: INTERNATIONAL WIRE WORKS, MENASHA, WIS. AN AFFILIATED COMPANY



West End earns its position as a responsible supplier of salt cake

In 1955, with its first offering of salt cake, West End assured the Industry of an ability to meet long-term commitments based on vast natural raw material supply, ample production and storage capacity, rapid and efficient transport facilities. By unconditional fulfilment of every commitment for over 4 years, West End has conclusively demonstrated its complete reliability as a major source of highest quality salt cake. Every normal and unanticipated requirement has been met with equal ease and dispatch.



Today, with even larger facilities and a determination to maintain the reputation it has earned, West End is solidly qualified to handle any size requirement in a wide marketing area where it is a logical source of salt cake for kraft paper manufacturers. You are invited to consult with us on the over-all economics of using West End Salt Cake.

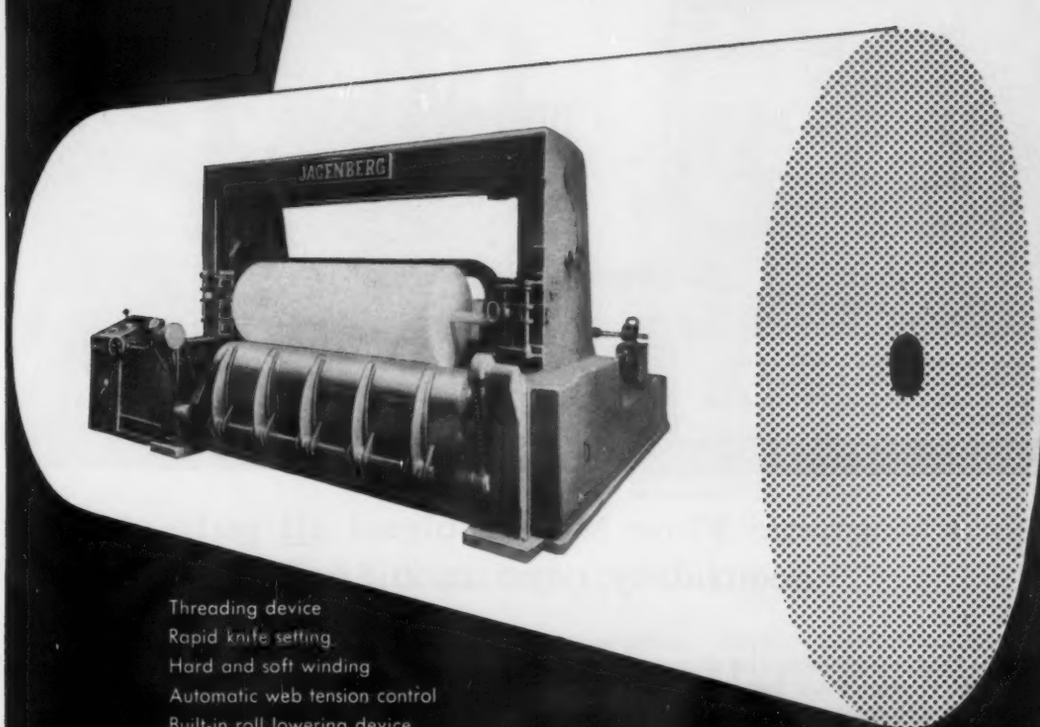
Stauffer CHEMICAL SINCE 1885

WEST END CHEMICAL COMPANY
DIVISION OF STAUFFER CHEMICAL COMPANY

EXECUTIVE OFFICES: 1956 WEBSTER, OAKLAND 12, CALIF. • PLANT: WESTEND, CALIF.

JAGENBERG

PNEUMATIC WINDER



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Built-in roll lowering device
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Unique rewind shaft guide system eliminates shaft play

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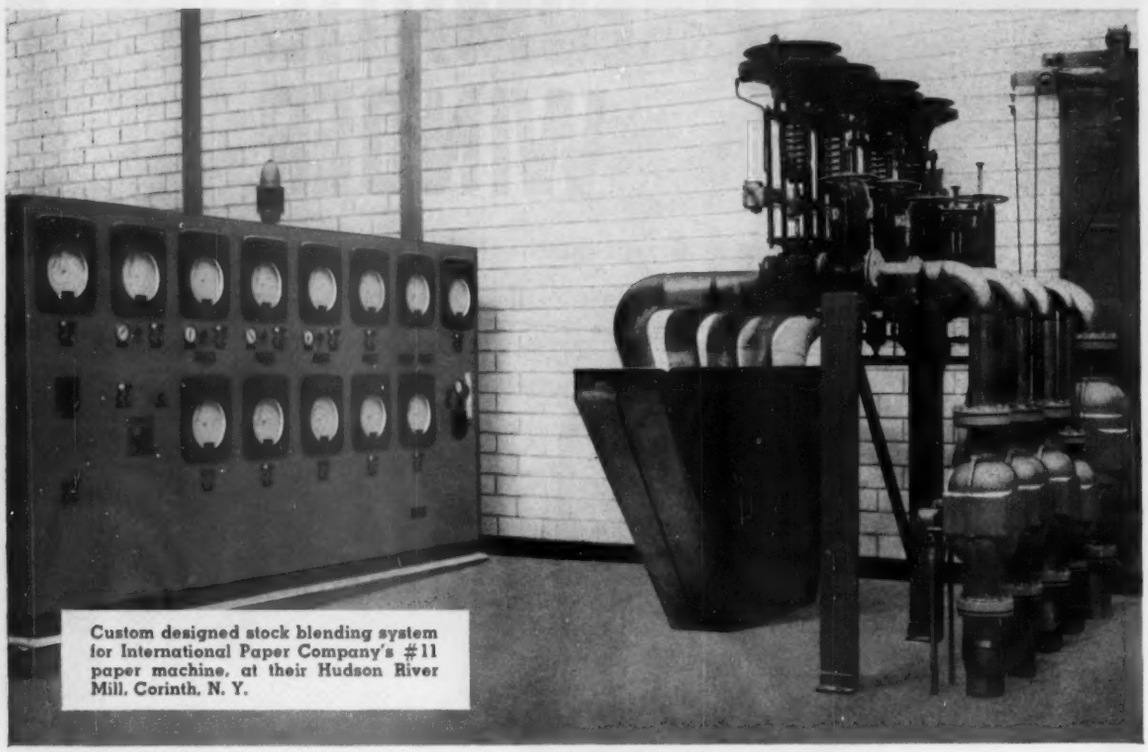
You're looking at the complete pulp stock blending system for a high speed paper machine



Custom designed stock blending system for International Paper Company's #11 paper machine, at their Hudson River Mill, Corinth, N. Y.

Foxboro Magnetic Flow Meters blend all pulp stocks accurately, continuously

Set the proportions for stocks . . . dyes . . . additives and walk away! That's the procedure for changing furnish grades on the Foxboro Stock Blending System at International Paper Company.

With this system, one man at a central panel can blend all 5 pulp stocks — as well as additives and dyes — accurately and continuously.

Each stock percentage is set on its own direct-reading dial — especially selected to meet International Paper's specific operating requirements. Settings are easier — more convenient — more accurate. And the entire system automatically adjusts for changes in machine demand, while all proportions are held exactly constant.

And since all stock measurements are made by the unique Foxboro Magnetic Flow Meter — the meter with no flow restrictions — there is nothing to plug up . . . nothing to interfere with high sustained accuracy of pulp flow measurement.

With Magnetic Flow Meters from 1/10" to 12" and larger, the Foxboro Stock Blending System will handle any number of pulp stocks, dyes, and additives. Every system is custom designed for each mill's own paper-making requirements — resulting in more consistent furnish — higher production. Your mill can benefit from this maintenance-free, space-saving system, too. Write for new engineering data sheet. **The Foxboro Company, 999 Neponset Avenue, Foxboro, Mass.**

FOXBORO
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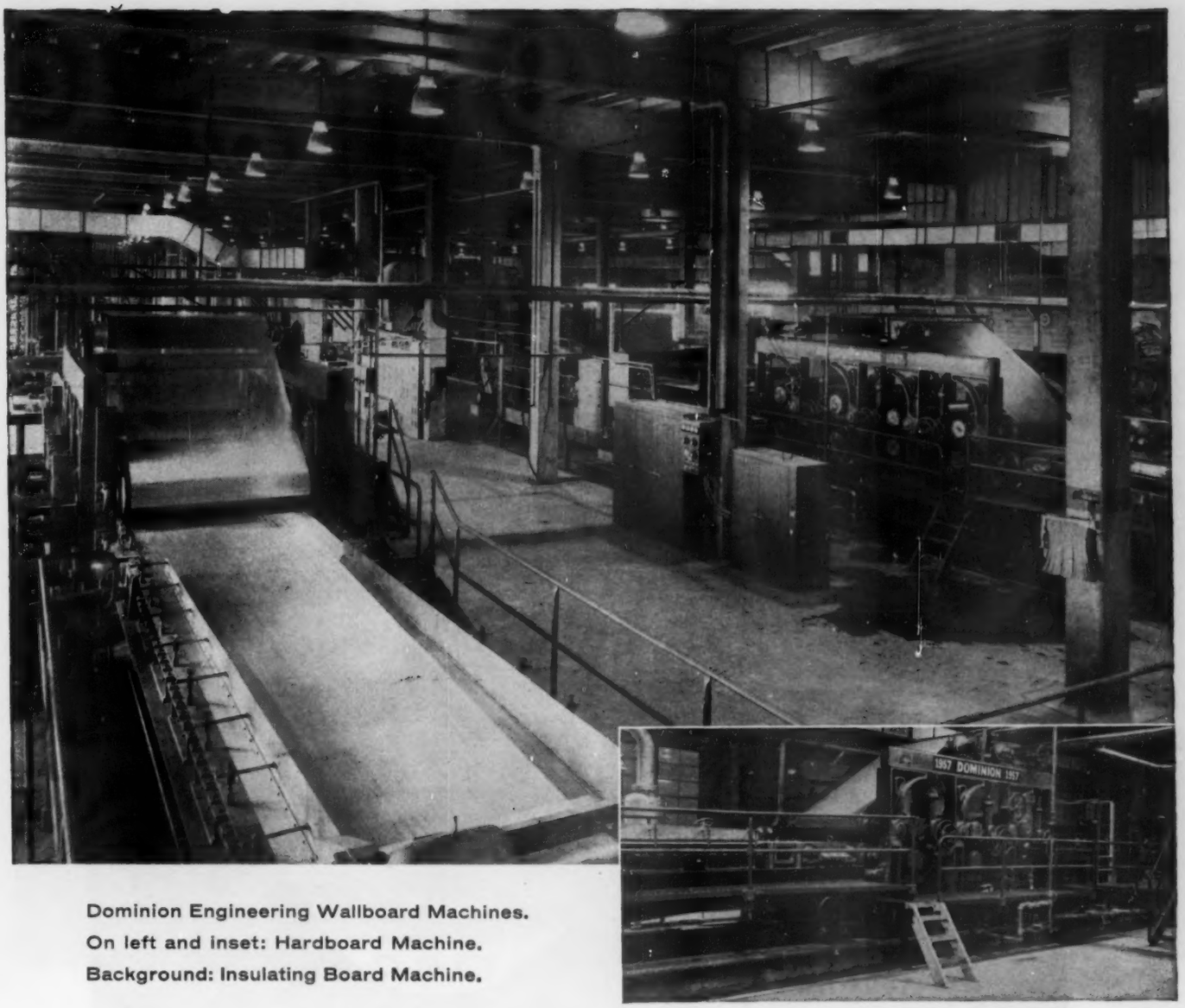
FIRST IN FLOW CONTROL



Dominion Engineering Wallboard Machines.
On left and inset: Hardboard Machine.
Background: Insulating Board Machine.

Designed and produced by DOMINION:

Hardboard and Insulating Board Machines, installed at the Saskatoon Mill of the Prairie Fibreboard Company.

DOMINION–Canada's foremost supplier of Pulp, Paper and Board Machines since 1920.

PAPER DIVISION

DOMINION ENGINEERING COMPANY LIMITED

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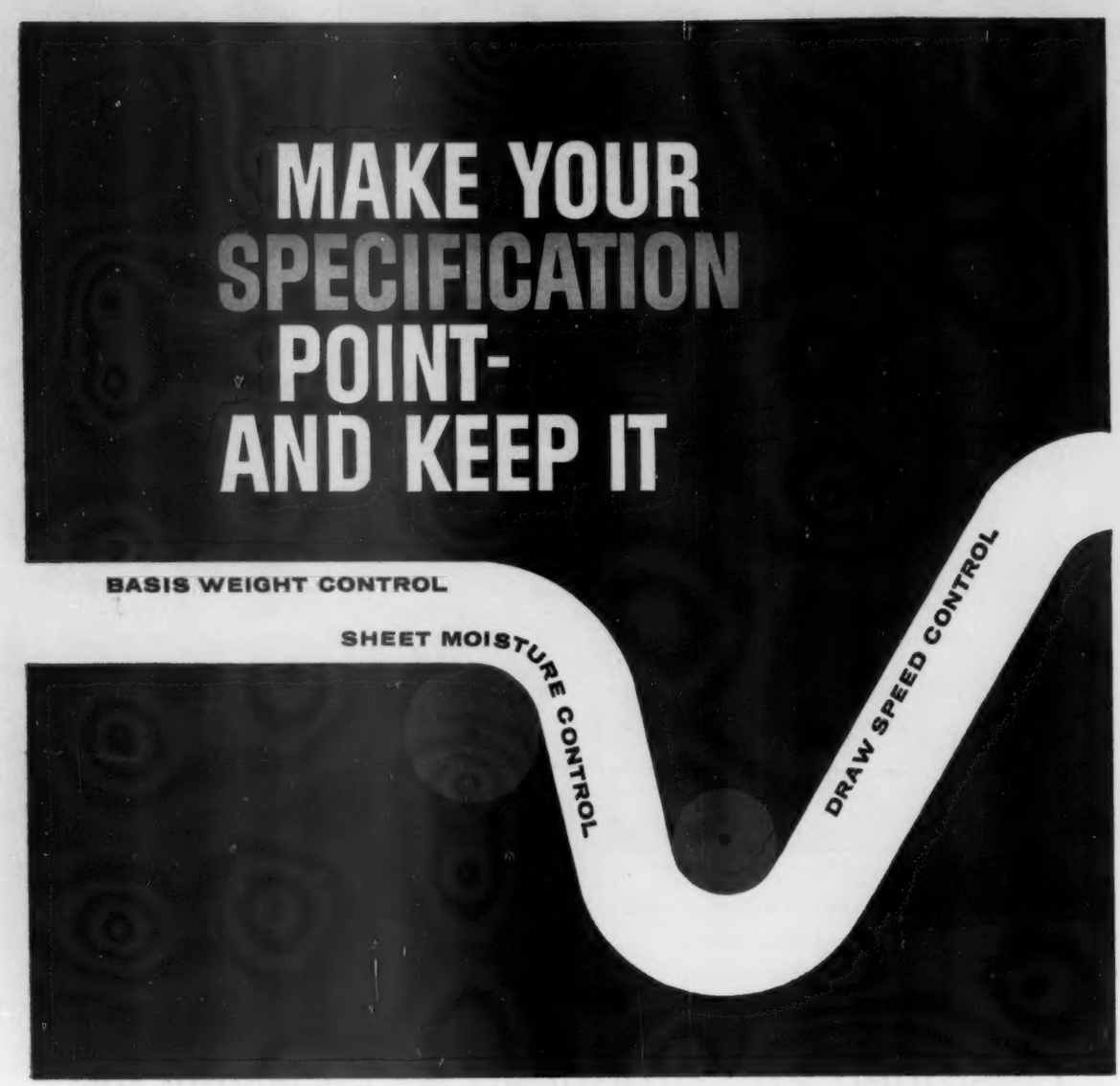


The paper industry's leader in basis weight and moisture control systems

Industrial Controls Department
PRINCETON DIVISION

CURTISS-WRIGHT
CORPORATION • PRINCETON, N. J.

The papermaker—or converter—who calls on the services of a company that supplies all the units for a complete system assures himself that these are *companion* tools designed to work together. Curtiss-Wright supplies all the tools for such systems.

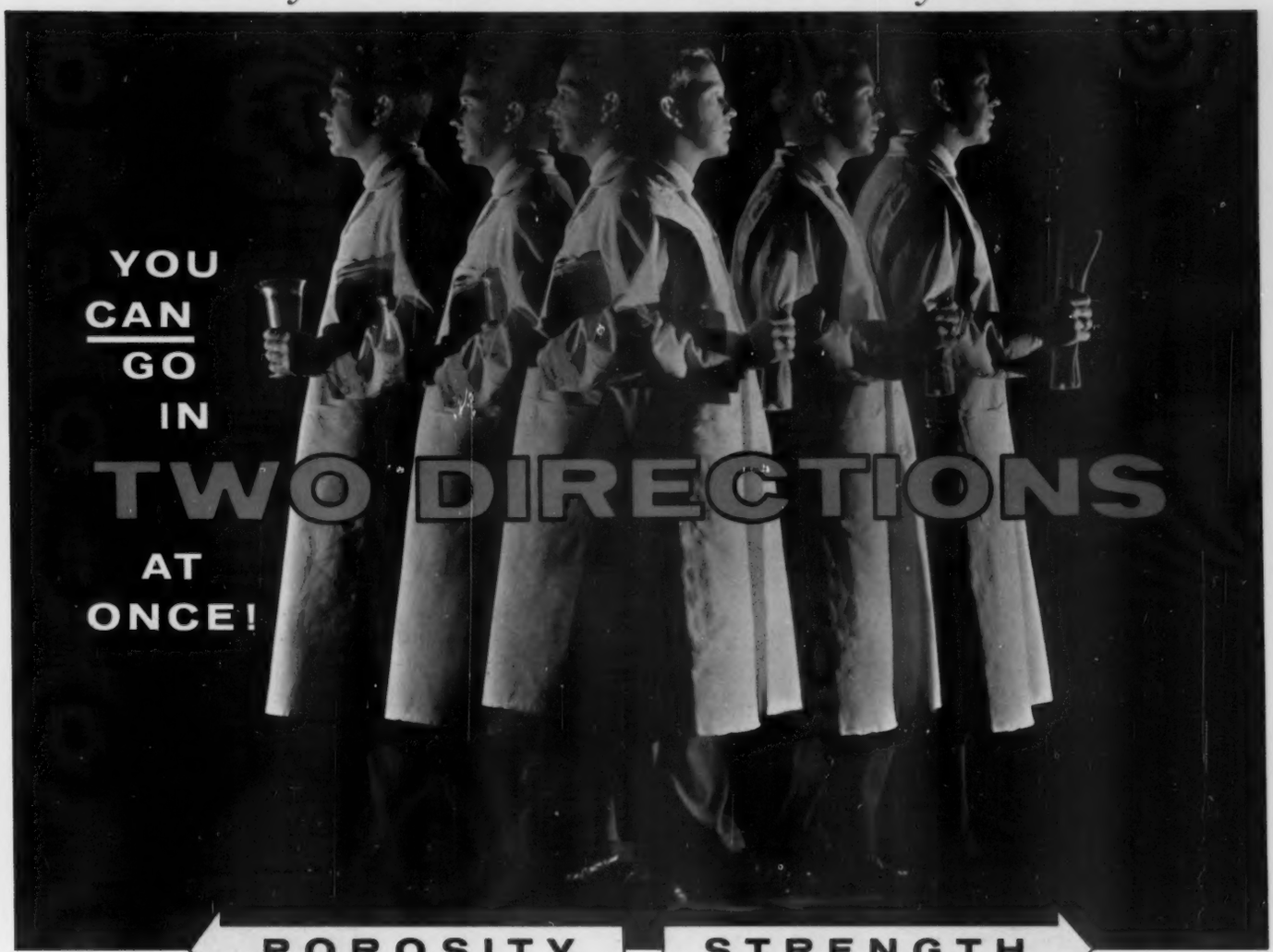
Curtiss-Wright *companion* tools permit faster startups and changeovers. Then, during processing, these same tools provide accurate measurement and control of the set-up specification.

One unit of a custom-designed system is the Curtiss-Wright Betagage. It uses nuclear energy to measure and regulate basis weight without touching the paper. Or it may be applied to the control of coating and impregnating operations. Another tool, Aquatel*, provides for instant reading and control of sheet moisture. And the Curtiss-Wright Draw Speed Gauge presents highly accurate readings of tensions between rotating rolls.

Curtiss-Wright combines modules such as these into complete systems that result in maximum profit from uniform quality—minimum loss of production per ton of stock. Discuss these products and the systems that they make possible with your Curtiss-Wright engineer. He's at your service—without obligation.

*Trademark registered

with Albany Felt chemical treatments and synthetics . . .



U-31 K-3 NYLON H-12 J-3 ORLON H-12 Z-5 DACRON W-6 U-55 H-14

At last, the ideal balance between *strength* and *drainage* in felt design can be obtained. With Albany's patented synthetic content design, greater resistance to abrasion is provided *and* Albany's special chemical treatments reduce the natural tendency of the synthetic yarns to be non-absorbent. Thus, two opposite aims can be reached simultaneously.

Most important to you, this combination of synthetics and chemical treatments can put your machine way ahead in production. Remember, Albany Felts not only last longer, they also give you *more tons per day.*

Start the wheels rolling toward maximum felt life and high daily production in *your* mill. Consult your Albany Felt Sales Engineer. Working with him is the team of experts who wrote the book — "Improved Felt Performance!"

If you have not received your copy of Albany's newest technical handbook "Improved Felt Performance" write for it today.

ALBANY FELT COMPANY

MAIN OFFICE AND PLANT, ALBANY, N. Y.

OTHER PLANTS: HOOSICK FALLS, N. Y.; N. MONMOUTH, ME.; ST. STEPHEN, S. C.; COWANSVILLE, P. Q.

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simple? no!

as complex as life itself

At Clinton we learn new things about corn almost every day.

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Clinton serves the PAPER industry

Clinton starches and dextrins will always meet your most exacting specifications. Consult your Clinton salesman. He will provide product information, arrange for prompt technical service, or assist you in any way possible.

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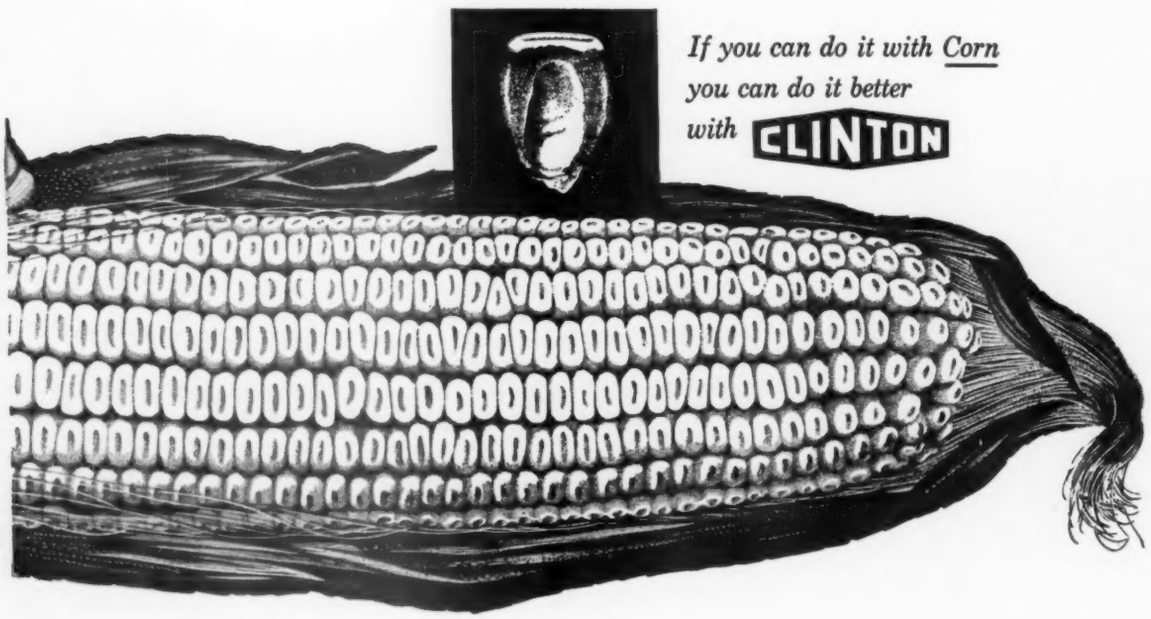


If you can do it with Corn
you can do it better
with CLINTON

another G-E
'8000'
development

GENERAL ELECTRIC ANNOUNCES . . .

New Custom '8000'* Motors

PROJECT '8000' . . . a major General Electric program of research, redesign, advanced manufacturing and improved customer service on A-c motors 150 to 6000-hp.

*Trademark of General Electric Co.

CUSTOM DESIGNED . . . New General Electric Custom '8000' motors are built specifically to meet your requirements. Selecting from specially designed enclosures, advanced insulation systems, custom-designed end shield and bearing constructions, and more than 15 custom-designed accessories—plus a countless number of electrical designs—General Electric engineers will create a motor to meet exacting needs, provide initial and continuing economy, and give long, reliable service. Turn page for features of new Custom '8000' motors.

NEW CUSTOM '8000' MOTORS GIVE TOP PERFORMANCE WITH LESS MAINTENANCE HERE'S WHY

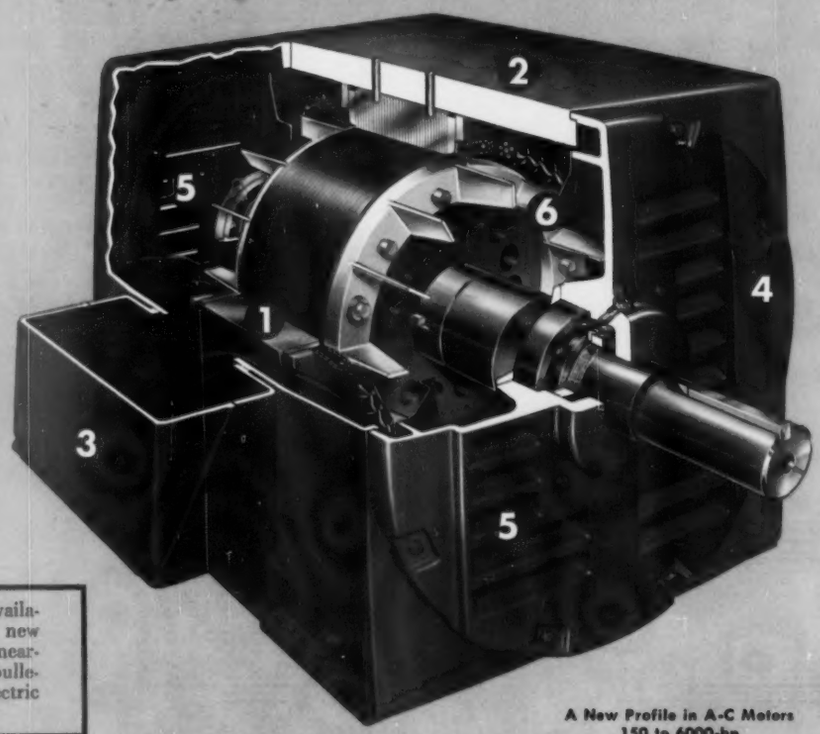
GENERAL ELECTRIC

FROM GENERAL ELECTRIC . . .

another G-E development

NEW Custom '8000'* Motors Give Greater Reliability Require Less Maintenance

1. **LONGER INSULATION LIFE**—Pre-wound core allows closer quality control and gives longer insulation life through improved varnish impregnation or silicone rubber encapsulation.
2. **BETTER CONSTRUCTION**—Cast iron frame withstands 20G simulated transportation shock tests; resists corrosion.
3. **FASTER INSTALLATION**—Conduit box has up to 3 times volume of ordinary boxes; lifting lugs, cast to frame, hold up to 12 times motor weight.
4. **EASIER MAINTENANCE**—Flat end shields are more adaptable to addition of accessories or modifications; are lighter—easily handled by one or two men.
5. **BETTER COOLING**—Double-end ventilation, new duct design and louvred air openings provide more efficient air distribution through motor, reduce hot spots.
6. **LOWER NOISE LEVEL**—Sound power has been cut up to 50% by redesigning frame sections, rotor fans, air deflectors and intakes.



A New Profile in A-C Motors
150 to 6000-hp

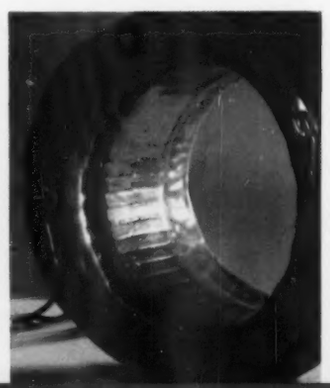
FOR COMPLETE INFORMATION and availability dates about General Electric's new Custom '8000' motor line, contact your nearby Apparatus Sales Office, or write for bulletin GEA-6865, Section 884-2, General Electric Co., Schenectady, N. Y.

NEW Polyseal SILICONE RUBBER INSULATION SYSTEM IS AVAILABLE ON CUSTOM '8000' MOTORS

Silicone rubber used in Polyseal insulation systems is a product of General Electric's Silicone Products Dept., Waterford, N. Y. . . . a leader in research, development, and manufacture of silicone materials. Supported silicone tape is a development of General Electric's Insulating Materials Dept., Schenectady, N. Y. Combining silicone rubber with dacron-glass supporting materials is a major engineering advancement, giving this material both the mechanical and dielectric strength required for use as a motor insulation. Polyseal insulation systems are available *only* on General Electric motors. Medium AC Motor & Generator Dept.

FORM-WOUND MOTORS

Polyseal supported silicone rubber insulation system provides greater mechanical, thermal, voltage and environmental endurance than unsupported silicone rubber. Glass fabric materials are imbedded in each layer of silicone tape, which, after coil wrapping is vulcanized under heat and pressure to seal the system against moisture and contaminants. General Electric form-wound open motors with Polyseal insulation system can be used in some severe atmospheres formerly reserved for totally-enclosed motors.



RANDOM-WOUND MOTORS

Polyseal silicone insulation system offers greater flexibility and better heat transfer than existing encapsulations . . . it operates effectively from —90C to 200C and will not crack under excess thermal cycling or severe moisture. After receiving G.E.'s standard random-wound insulation treatments, Polyseal insulation is applied to stator and end turns, completely sealing windings with a thin, waterproof, inert covering which protects against extreme moisture, most chemical fumes, dust and corrosion.

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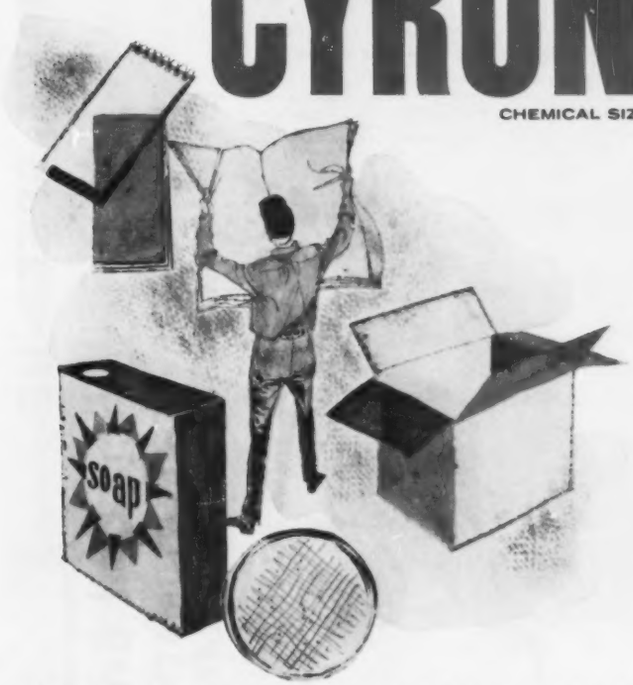
Progress Is Our Most Important Product

GENERAL ELECTRIC

5 INSTANCES WHERE PAPERS DO A BETTER JOB BECAUSE THEY'RE SIZED WITH CYRON®

CHEMICAL SIZE



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—because CYRON's high ink resistance prevents feathering.

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—because a comparatively small amount of CYRON size gets more mileage from the inks and because CYRON helps produce a better gloss.

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—because CYRON provides alkaline resistance and high water resistance.

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—because CYRON sized paperboard takes ink better.

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—because CYRON provides resistance to *alkalis*, as well as acids.

For use in the beater, *on the surface*, or both. No rosin, alum or wax required when you use CYRON. Available in easy-to-dissolve flake form—shipped in 50 lb. multiwalls. For complete technical information write for free booklet, CYRON SIZE.

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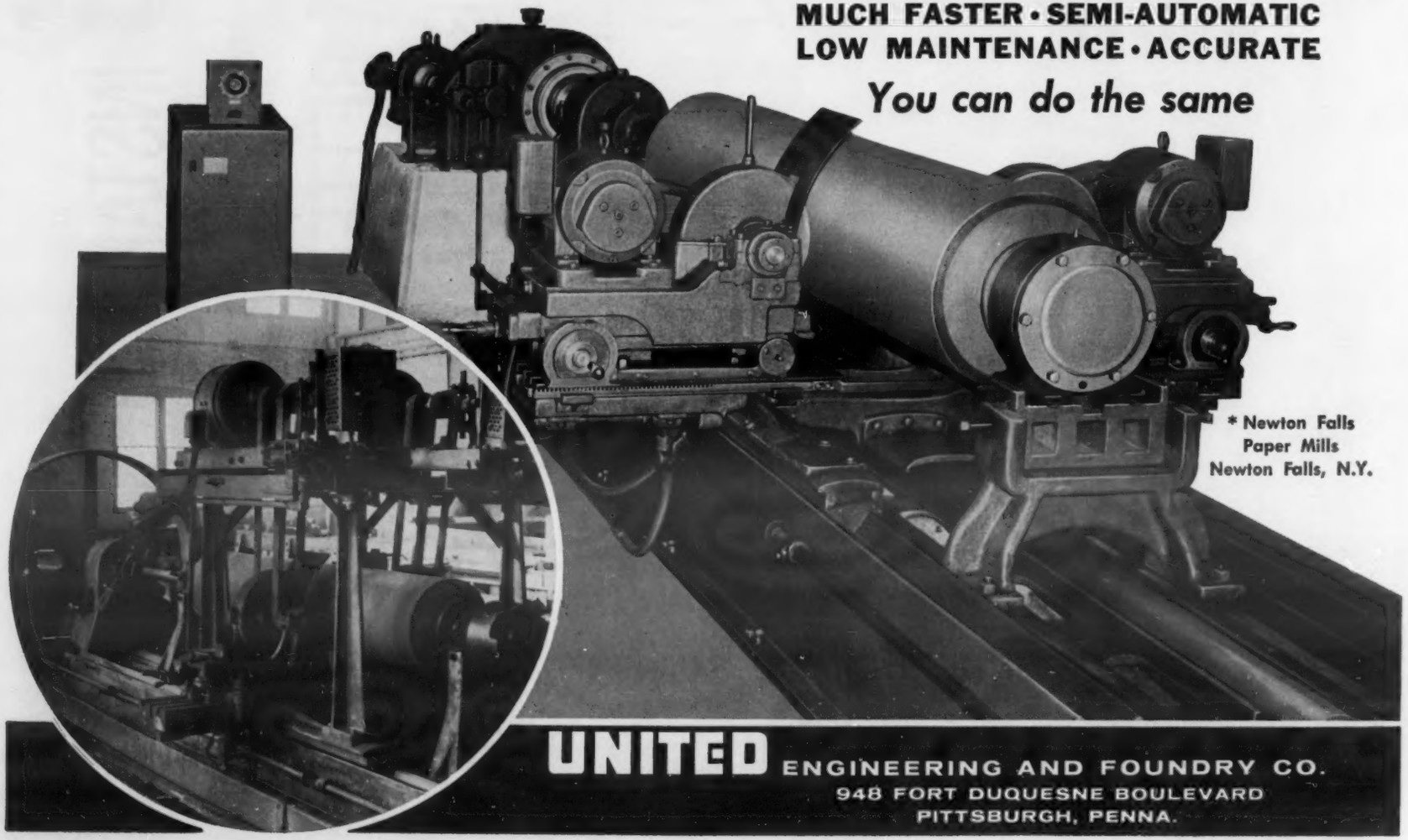
Modernizes Their LOBDELL Roll Grinder

MUCH FASTER • SEMI-AUTOMATIC
LOW MAINTENANCE • ACCURATE

You can do the same



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Paper Mills
Newton Falls, N.Y.

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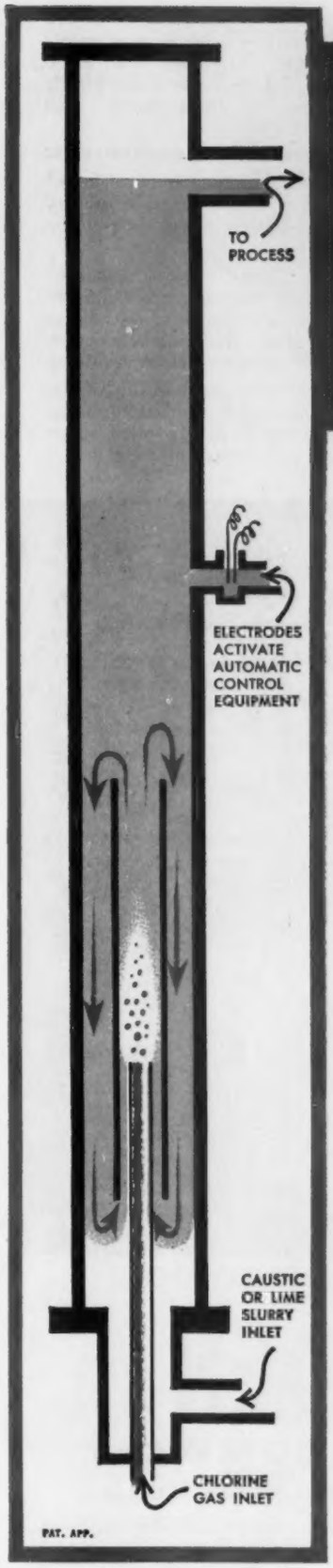
PITTSBURGH, PENNA.



PENNSALT CONTINUOUS HYPOCHLORITE REACTION TOWER

uniform bleach liquor produced in less space...at less cost than by conventional batch system

To meet the request of the pulp industry for a simple and reliable continuous sodium or calcium hypochlorite preparation system, Pennsalt engineers applied the well known basic principles of batch preparation.

1. The preparation of the alkali prior to chlorination at constantly uniform strength.
2. Reaction column design for rapid and complete mixing and reaction of the chlorine and alkali.
3. Immediate and continuous discard of grit and inert materials removed in the centrifugal clarification of calcium hypochlorite.

It is known that the velocity of reaction of chlorine and an alkali is dependent upon the hypochlorite ion content. The Pennsalt Hypochlorite Reaction Column was designed to incorporate this principle. The rapid upflow within the draft tube causes recirculation of hypochlorite to the base of the column to mix with inflowing alkali. The resulting alkaline hypochlorite reacts instantly with the chlorine in a short reaction zone enabling the electrodes to sense system changes almost instantaneously and the control instruments to take prompt corrective action.

Ask Pennsalt Technical Service for help in solving your particular problem. Write for free Technical Bulletin H-2024. Pennsalt of Washington Division, PENNSALT CHEMICALS CORPORATION, Tacoma 1, Wn.

References: TAPPI Vol. 38 No. 10; Paper Trade Journal, May 7, 1956; Pennsalt Technical Brochure No. 21
Reference Installations (Calcium Base): Longview Fibre Co.; St. Helens Pulp & Paper Co.; Publishers' Paper Co.

Pennsalt of Washington Division
TACOMA 1, WASHINGTON

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Pennsalt Chemicals
ESTABLISHED 1850

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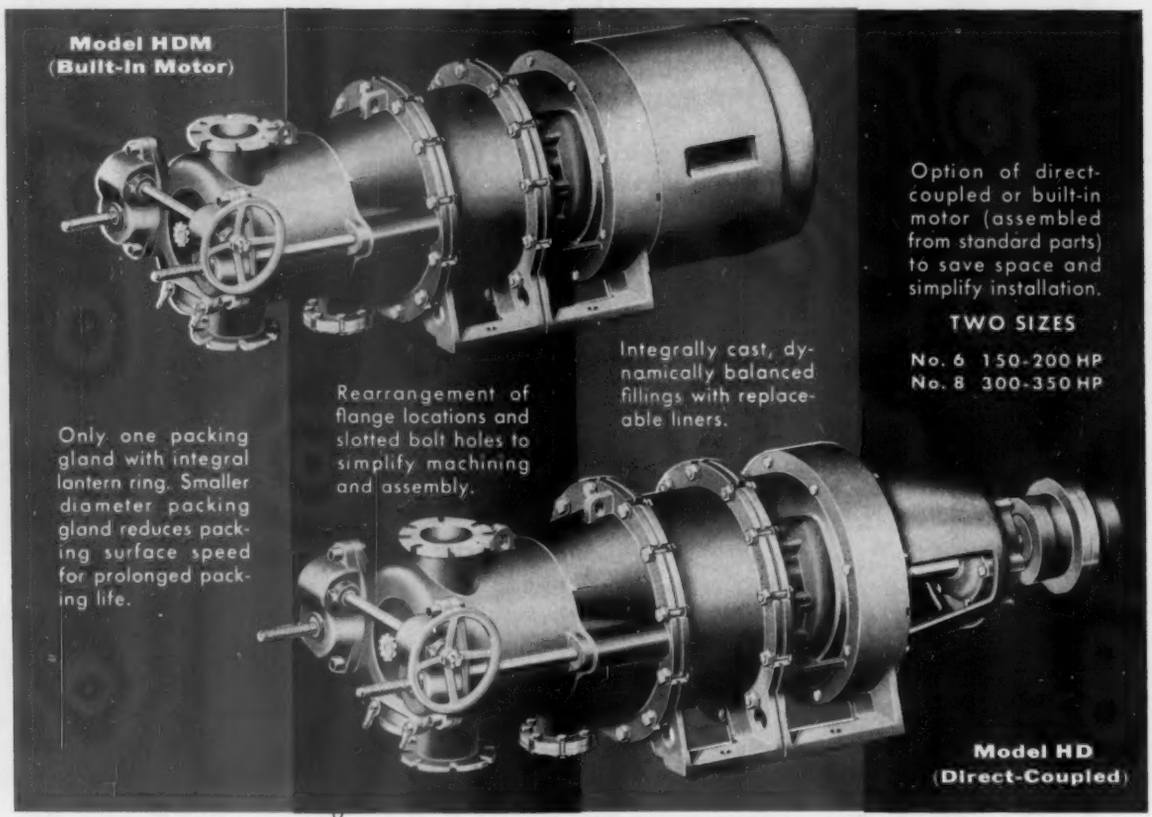
Morden's creative engineering, combined with the cooperative experience of nearly 300 paper mills using more than 1000 Morden refiners, brings you a completely new form . . . of the "Stock-Maker" and "Stuff-Maker."

These new machines are engineered to:

1. Further improve the "Stock-Maker's" reverse-flow, sealed-pressure beating treatment—so well proven through the last 25 years.
2. Retain the "Stuff-Maker's" straight-through-flow jordaning treatment—requiring only a simple filling interchange to give brushing or cutting treatment—now all in the same refiner housing.
3. Maintain Morden's high quality of materials, workmanship and performance—with savings of 20% in initial equipment and replacement filling costs.


Model HDM
(Built-In Motor)
Option of direct-coupled or built-in motor (assembled from standard parts) to save space and simplify installation.
TWO SIZES
No. 6 150-200 HP
No. 8 300-350 HP
Integrally cast, dynamically balanced fillings with replaceable liners.
Rearrangement of flange locations and slotted bolt holes to simplify machining and assembly.
Only one packing gland with integral lantern ring. Smaller diameter packing gland reduces packing surface speed for prolonged packing life.
Model HD
(Direct-Coupled)

INVESTIGATE NOW FOR SAVINGS UP TO 20%!

Ask for further description of the new "Stock-Maker" and "Stuff-Maker" and how they can benefit your operation. We shall be happy to visit you for an in-the-mill discussion of your requirements.

MORDEN
MACHINES COMPANY

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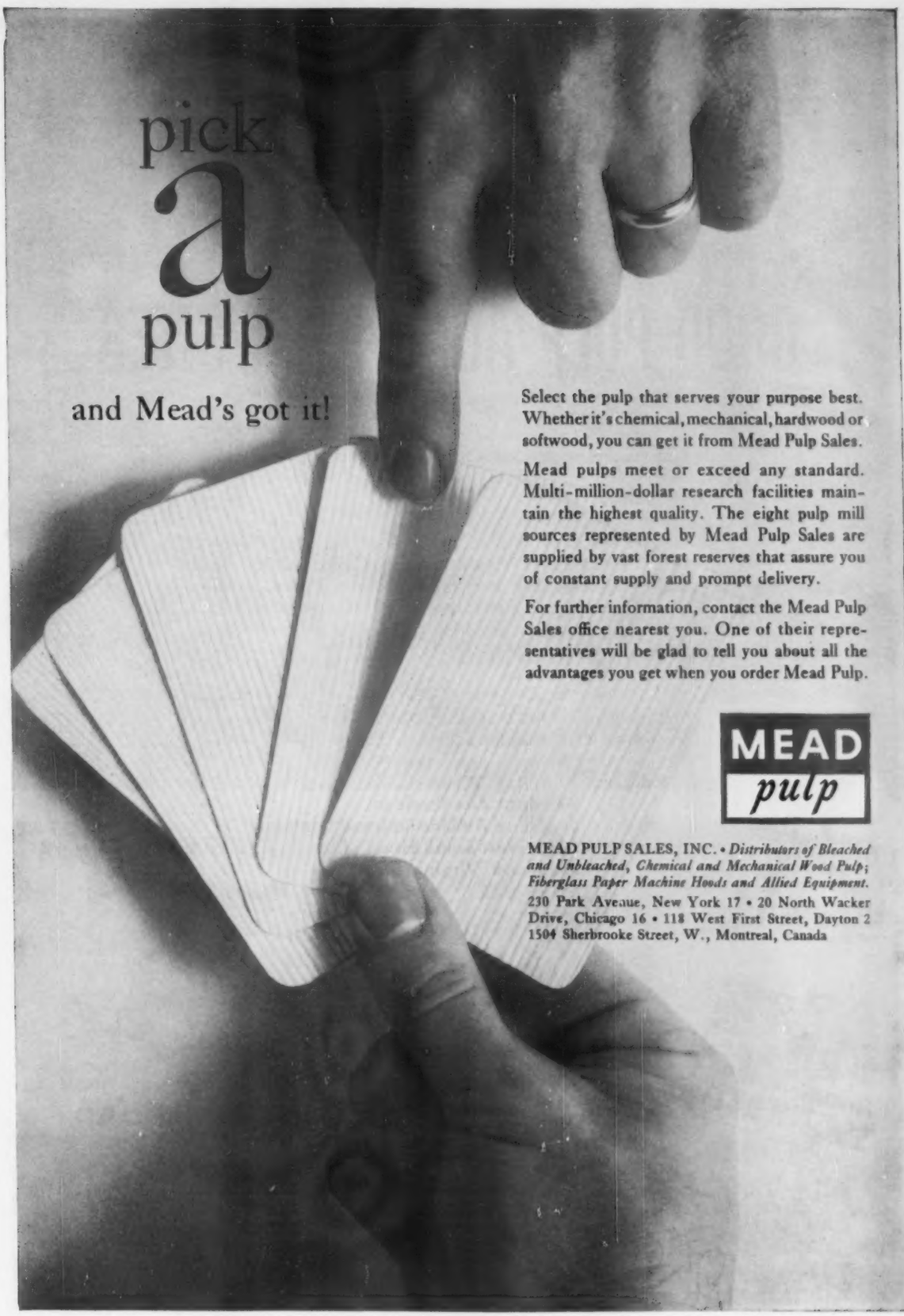

Select the pulp that serves your purpose best. Whether it's chemical, mechanical, hardwood or softwood, you can get it from Mead Pulp Sales.

Mead pulps meet or exceed any standard. Multi-million-dollar research facilities maintain the highest quality. The eight pulp mill sources represented by Mead Pulp Sales are supplied by vast forest reserves that assure you of constant supply and prompt delivery.

For further information, contact the Mead Pulp Sales office nearest you. One of their representatives will be glad to tell you about all the advantages you get when you order Mead Pulp.

MEAD
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Prime requirements for successful pulp and paper operations are timber and water. Both are in abundant supply in the Seaboard Southeast.

In the six states of Virginia, North Carolina, South Carolina, Georgia, Alabama and Florida, more than 113,000,000 acres, or 60% of the total land area, are in growing forests. Nowhere in the world does good timber reproduce so rapidly. Numerous streams afford an abundant water supply for pulp and paper operations.

Let us tell you about some of the excellent sites which we have catalogued for the pulp and paper industry. Ask for a report based on your specific requirements.

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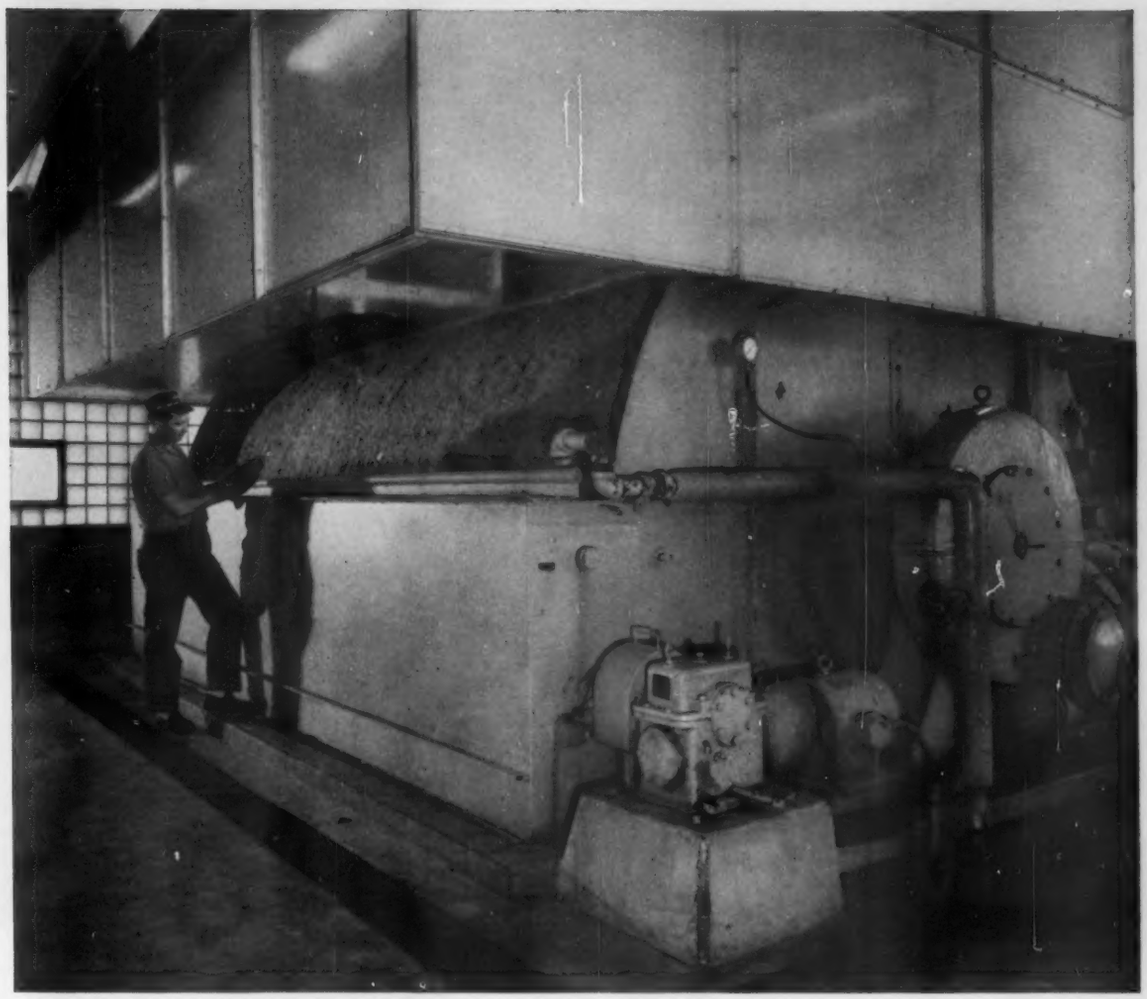

Pulp Washers that give a "Shower of Value!"

Essential to the economical production of quality paper, a well-washed pulp with low dilution is mandatory at Thilmany Pulp and Paper Company.

That's why the Kaukauna, Wisconsin papermaker relied on Swenson to provide the washers that furnish clean pulp at the lowest possible dilution. Now, with its line of Swenson 4-drum, 5-stage brown stock washers, Thilmany reports improved performance . . . *and* marked reductions in operating costs accompanied by an increase in quality of paper.

Long-time favorites, Swenson Pulp Washers are designed and engineered specifically for brown stock washing. Send for your copy of the interesting new color Bulletin 243, "Processing Profiles"—a tour of Swenson Processing Equipment in action at Thilmany and many other installations.

Swenson Evaporator Company, 15632 Lathrop Avenue, Harvey, Illinois.

PROVED ENGINEERING FOR THE PROCESS INDUSTRIES SINCE 1889

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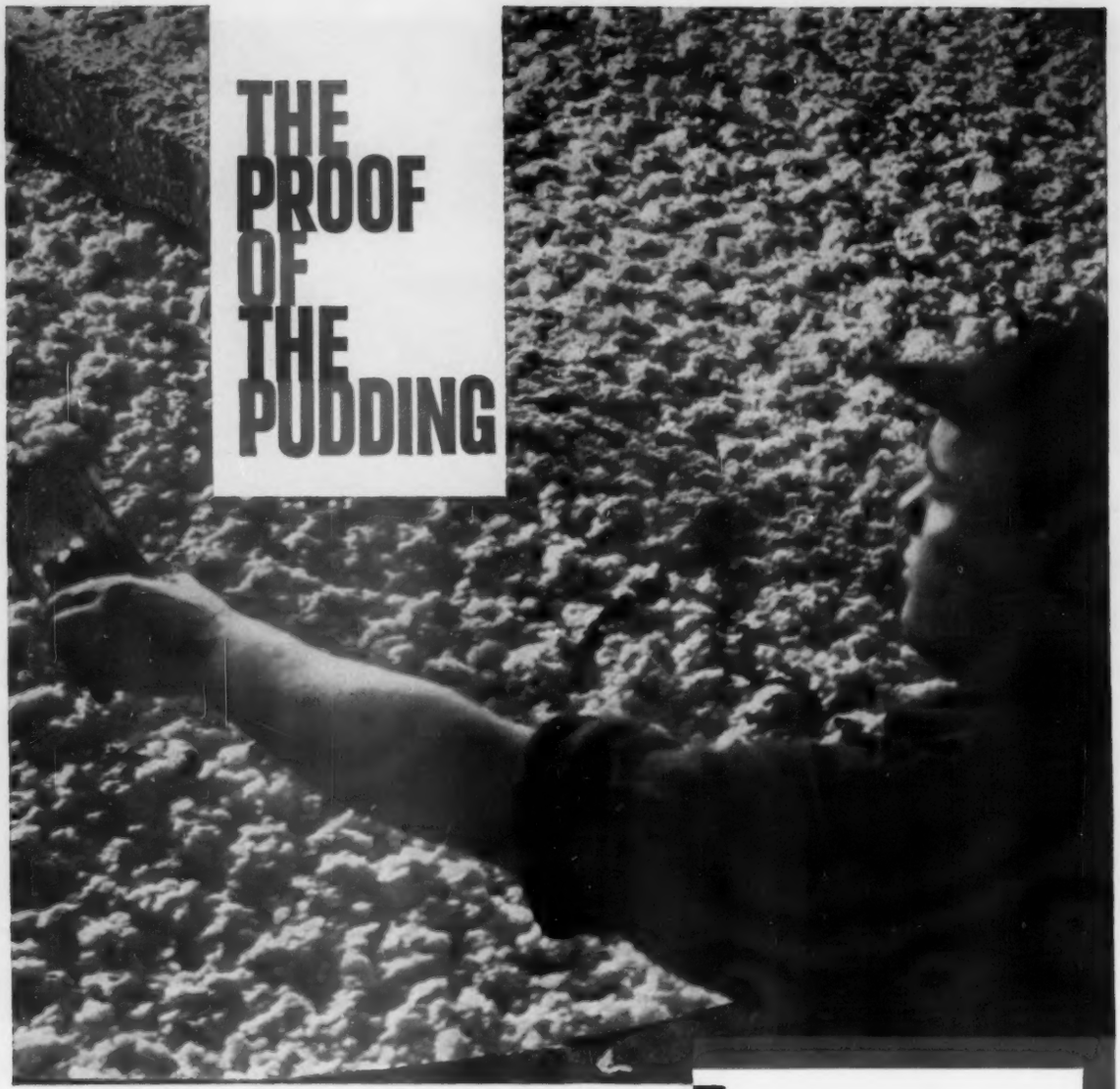

The proof of THIS pudding is in the pulp it produces! And where pulp is concerned, there is none superior to that made by Howard Smith.

This is a "beater", one of many such machines used to develop the maximum strength of the pulp. Sizing and colour also are added at this point, according to formula scientifically worked out in Howard Smith laboratories.

When you use the best pulp possible to make your paper, you can't help but produce a better product. So always specify Howard Smith pulp . . . the proof of its superiority is in the paper it produces.

Progressive paper companies rely on these quality pulps:

SEAGULL
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Another User Testimonial for Homelite...

"My Homelites give the kind of service a woodsman likes"

Mr. D. T. Hayes has a logging and paper wood operation in Kellyton, Alabama. His profits depend on having chain saws that will give him consistent, dependable operation. That's why he chose Homelite.

The new Homelite 9-26 is the most powerful saw in the Homelite line. It's the first *all-new* gear-drive chain saw designed for the professional woodcutter! From its streamlined outward appearance to the new design of its famous Homelite engine, the 9-26 is *new* clear through. Many new features save you time and money — dual control chain oiler for finger-tip oiling with either hand; new centered bar and pistol grip, perfectly aligned to help you fell a tree exactly where you want it. For quick, on-the-job service, just loosen one captive wing nut and the entire engine shroud is easily removed. A choice of gear ratios — either 2.8 to 1 or 3.5 to 1.

PROOF — Mr. Hayes writes: "We are now running five Homelite Chain saws. All have, and are giving, the kind of service a woodsman likes." Ask your Homelite dealer for a free demonstration of the new 9-26. And while you're there, ask to see the *full* line of Homelite high quality chain saws. You'll soon see why Mr. Hayes and thousands of other professionals insist on Homelite for dependable, *profitable* wood cutting!

9 26

As little as $7.10 weekly after small down payment

- **fells trees up to 10 feet in diameter**
- **only 26 pounds (less bar and chain)**
- **straight blades 18" to 60"**
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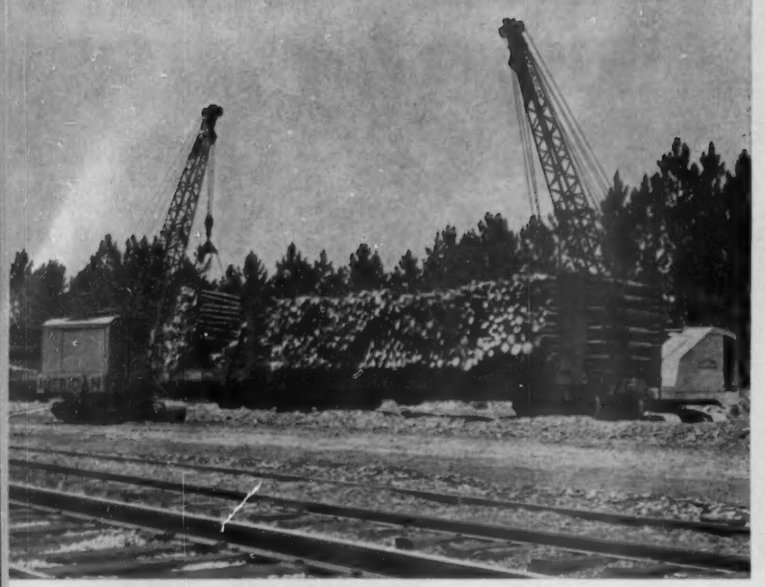
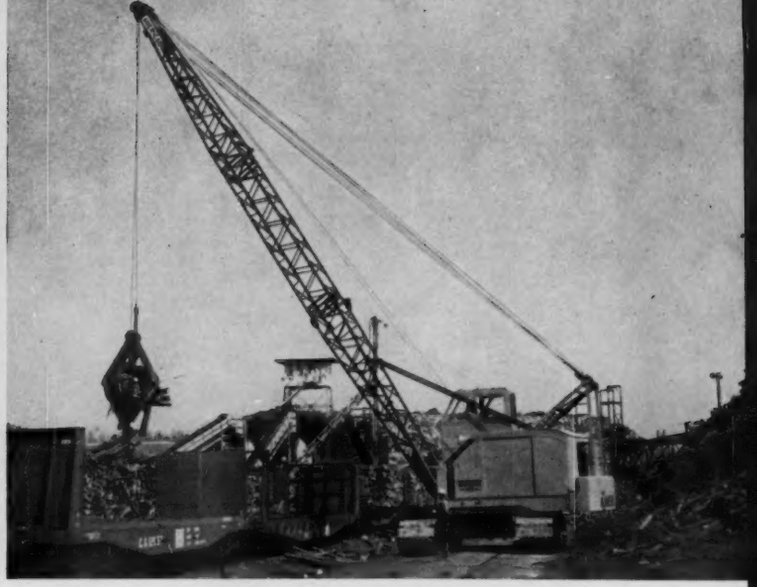


LOADING FLATCARS: Two American cranes increase production, in Florida. AMERICAN 300 Series Crawler Cranes.



ORANGE PEEL: Interchangeable fronts for a variety of work in Georgia. AMERICAN 700 Series Crawler Crane.

UNLOADING TRUCKS: Pulpwood transportation flows steadily, efficiently in Virginia. AMERICAN 300 Series Self-propelled Crane.

CHARGING FEEDER: Pulpwood conquered with ease, in Wisconsin. AMERICAN DiesELectric.

WHY NOT PROFIT BY THE EXPERIENCE OF OTHER AMERICAN CRANE OWNERS!

One of the most respected, most reliable names in the pulp wood handling field, American Hoist has earned a leading reputation for developing superior load lifting machinery. Owners and operators of American cranes can depend on "years-ahead" engineering features to provide them with efficient load moving services. Their acceptance of American dependability and versatility is another reason why you'll see American cranes in use by more of the nation's top pulp yards.

If expensive, single-duty equipment sits idle in your yard, now is the time you should fully examine the potential of multi-purpose American cranes. They can cover a wider variety of jobs than almost any other machine you own. Handling loads of all shapes and types, American cranes are tailor-made for almost every job in your yard. With interchangeable fronts . . . hooks, grapple, clamshell, dragline, shovel . . . demands of the paper industry are met by a complete line of American Cranes. Based on the experience of other American owners and operators, Americans are job tested . . . job proven . . . job ready . . . to help you cut costs of your pulp handling operations.

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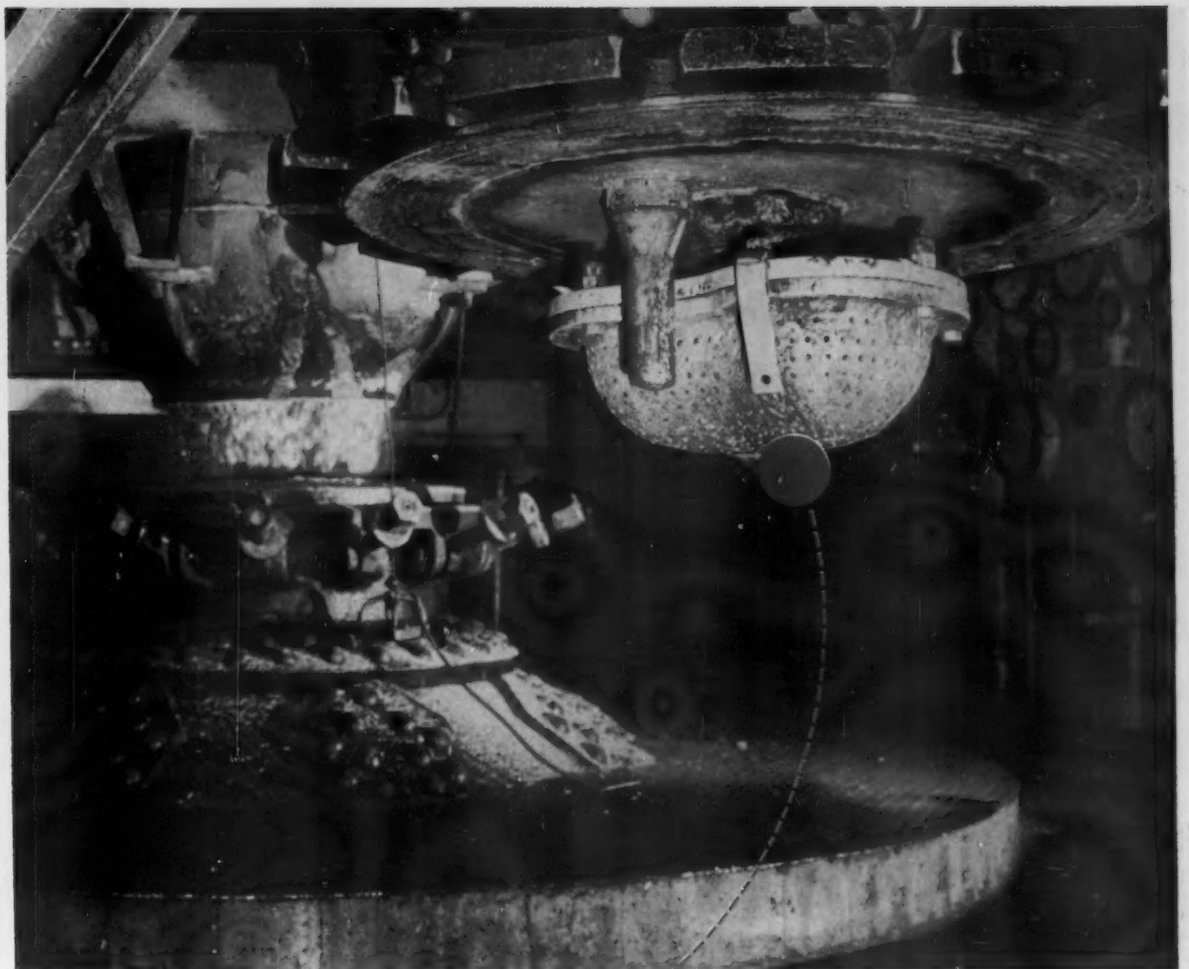

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This *ESCO* Alloy 45S top digester relief strainer casting is still resisting the corrosive attack of sulphur dioxide, acid fumes and steam at 280°F. and 80 psi. after 28 years of continuous service. This is but one of many, many testimonials that demonstrate the thorough understanding of pulp mill requirements by *ESCO* metallurgists.

ESCO knows digester systems and makes a complete line of custom valves and fittings. *ESCO* custom castings in Alloy 40, 40L, 45L, 45S, 43H, 32C, 20 (Duriron) and Hastelloy* are found in pulp mills everywhere.

Tell your nearby ESCO representative about corrosion problems in your plant, or write direct. Ask for your free copies of Alloy Notebook No. 7, "What Is Corrosion?", and the Process Equipment Catalog 175.

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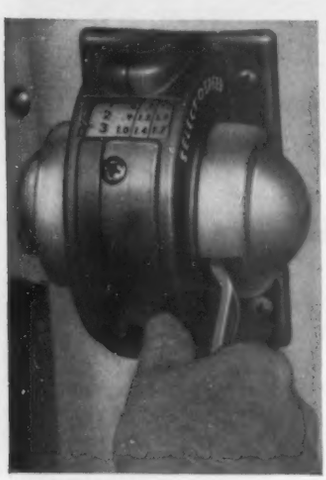

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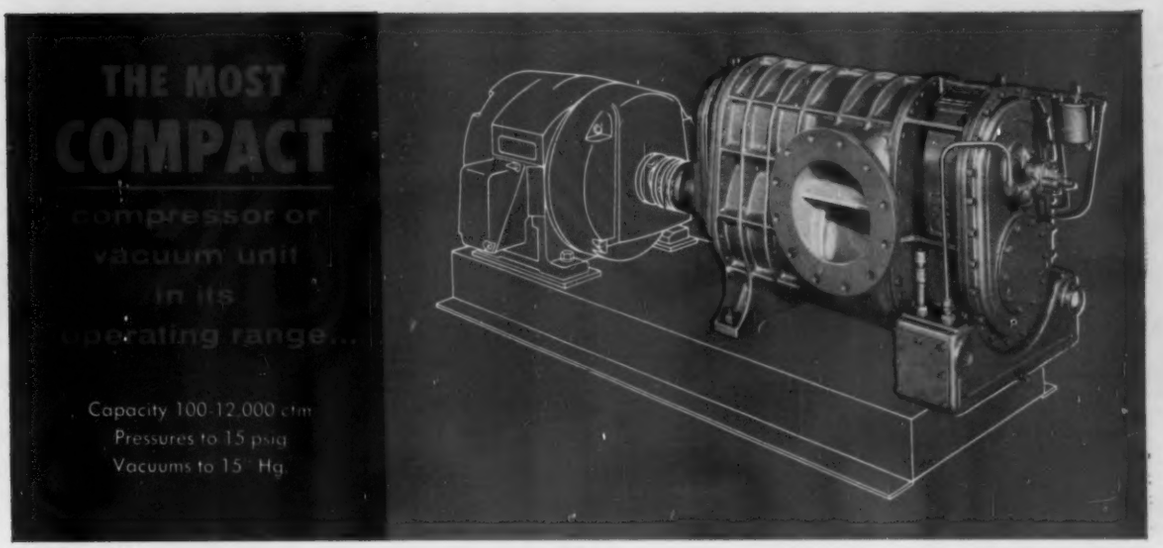
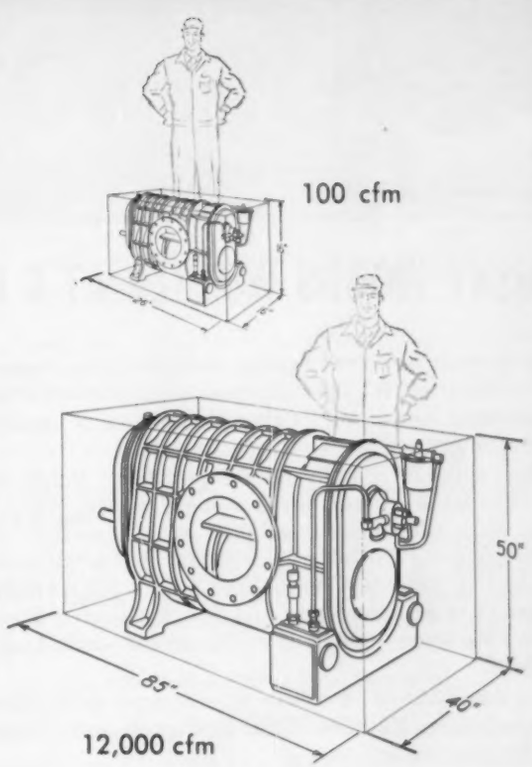


THE small, compact design of the Ingersoll-Rand Axi-compressor often permits installation in close quarters where no other compressor would fit. These savings in floor space and head room are often important considerations. And because it operates smoothly, with *no vibration*, it can be installed on small, low-cost foundations—a big advantage in any application.

In the Axi-compressor, two meshing cycloidal rotors operate with no metal-to-metal contact, delivering a smooth, continuous pulsation-free flow of air or gas, without contamination from oil. The rotors need no lubrication and no bulky air receiver is required. The compressor operates at high speeds and can be direct-connected to standard electric motors.

Axi-compressors are available in sizes from 100 to 12,000 cfm, for pressures to 15 psig, and vacuums to 15" Hg. Ask your Ingersoll-Rand representative for complete information on the cost-saving advantages of the Axi-compressor. Or send for a copy of Bulletin No. 11,001A.



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PUMPS • CENTRIFUGAL & RECIPROCATING COMPRESSORS • DIESEL ENGINES • AIR & ELECTRIC TOOLS • TURBO BLOWERS • STEAM CONDENSERS

HUSKY WOODS WORKER AT A LOW PRICE--THE OLIVER OC-4

Pep up your pulpwood hauling. Let the action-eager Oliver OC-4 take over! It's the right-sized, right-powered tractor for woods work—preferred for its mobility, ease of handling and dependability.

Now with Oliver's advanced "Spot-Turn" clutch steering, the OC-4 is the greatest crawler value in its class. "Spot-Turn" gives you greater maneuverability, easier operation. A touch on simple lever controls gives you any kind of turn—*fast!* Or a dead stop instantly! With "Spot-Turn," you do more work in less time at lower cost. And you work safer. Steering is always the same—uphill, downhill, sidehill—with load, without load.

See the Oliver OC-4 crawler at your dependable Oliver distributor's soon. Examine it. See how much more Oliver gives you for your money.

The Oliver OC-4 is a speedy, 30 h.p. worker of compact, modern design. Four-speed transmission assures ample speed and power—from 1½ m.p.h. to a lively 5½ m.p.h. Full line of attachments—dozer, winch, loader, etc. Gas or diesel power.

THE **OLIVER** CORPORATION

Industrial Division, 19300 Euclid Ave., Cleveland 17, Ohio

a complete line of industrial wheel and crawler tractors and matched allied equipment

THIS NEW QUILL-TYPE AJUSTO-SPEDE® DRIVE

Plus

THIS NEW K-2 CONTROL and PUSH-BUTTON STATION

Red tint indicates adjustable speed member.

Give You Controlled Adjustable Speed from an AC Power Source

in a Compact, Low Cost 3-Unit Drive Package

by

DYNAMATIC®

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Three compact components, the Ajusto-Spede Drive, the K-2 Control, and the push-button station make up this complete drive package which provides controlled adjustable speeds for any application from ½ HP through 7½ HP at 1800 RPM.

Remote wall mounting of the control panel conserves space on the driven machine; the push-button station places vital controls at the operator's finger tips.

Standard control features include on-off clutch control, infinite speed adjustment, constant speed regulation, and jogging. Any of a variety of special features may be easily and economically added to the standard control by the installation of a single resin-encapsulated circuit.

Send for complete information covering design and operation of the new models ACM-903 and 904 Ajusto-Spede Drives. Read how the new K-2 Control provides infinite speed adjustment, on-off clutch control, constant speed control, jogging, threading, cascading, and acceleration control.

Our New Bulletin K-2-159 is Now Available.

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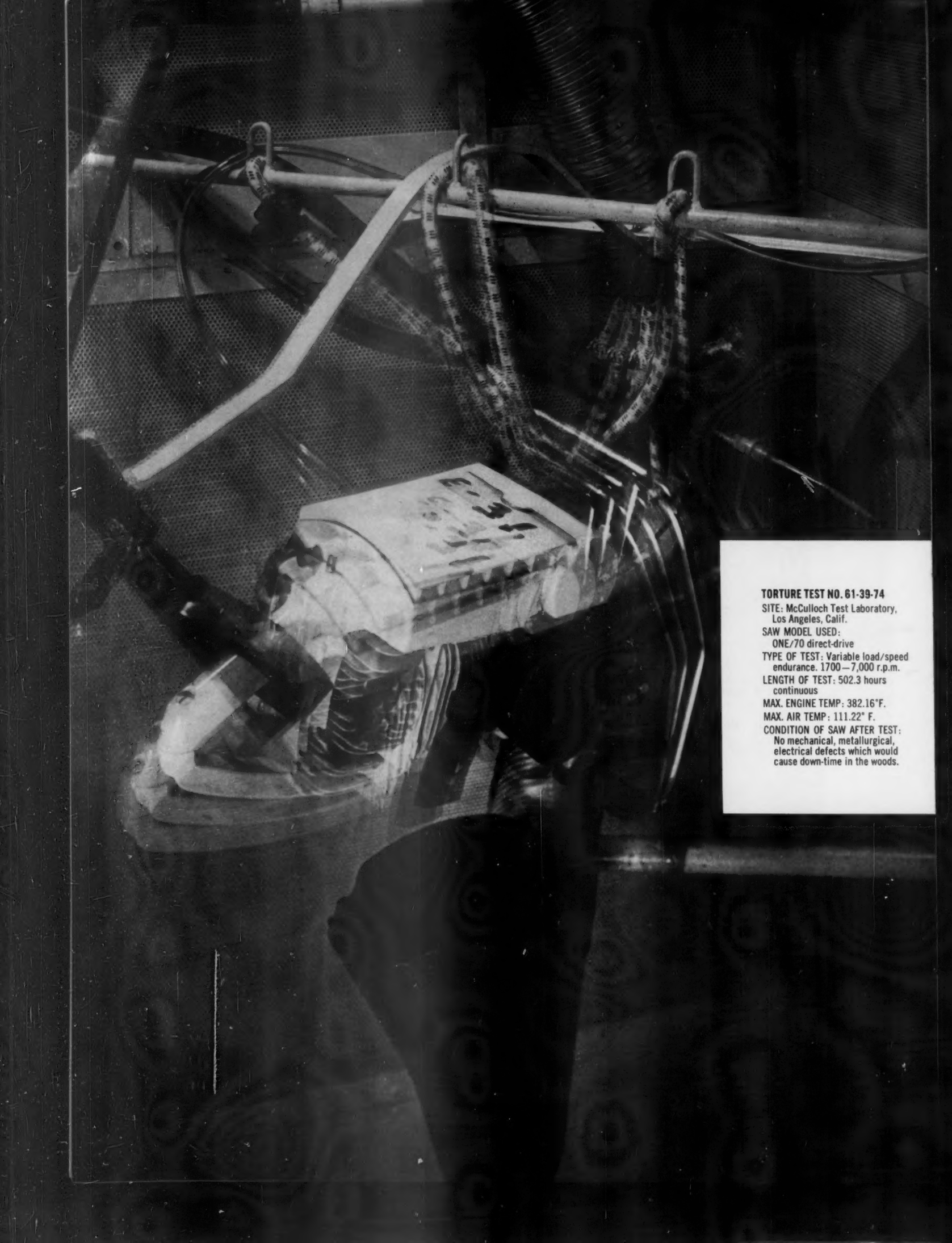


TORTURE TEST NO. 61-39-74

SITE: McCulloch Test Laboratory, Los Angeles, Calif.

SAW MODEL USED: ONE/70 direct-drive

TYPE OF TEST: Variable load/speed endurance. 1700—7,000 r.p.m.

LENGTH OF TEST: 502.3 hours continuous

MAX. ENGINE TEMP: 382.16°F.

MAX. AIR TEMP: 111.22° F.

CONDITION OF SAW AFTER TEST: No mechanical, metallurgical, electrical defects which would cause down-time in the woods.

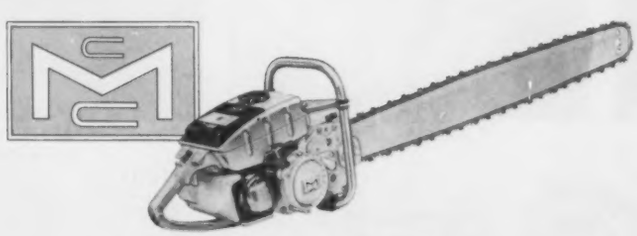
Meet McCulloch's New **NUMBER ONE** Saws

500 BRUTAL HOURS IN TORTURE CHAMBER PROVE STAMINA OF NEW McCULLOCH NUMBER ONE SAWS

A logging job takes rugged men and rugged chain saws. That's why the new McCulloch *Number One* chain saws were designed to be tough – built to be tough – *proved tough by torture test.*

The large picture at left shows a brutal endurance test. It's just one of hundreds of torture tests the new McCulloch saws had to pass. These torture tests prove that McCulloch *Number One* saws were built to take a beating and still stay on the job. Extensive field testing confirmed the lab torture tests. Hundreds of professional loggers and woodcutters throughout the country tested the new McCullochs *on the job.* Again, results proved that McCulloch makes the world's *Number One* chain saws.

See your McCulloch Chain Saw Dealer for a free demonstration.



ONE/80 Gear-Drive

- More lugging power than any other saw its size
- Only 25 pounds • Takes bars up to 44"
- Takes 15" plunge bow • Dynamically balanced
- Pintail Chain. • **Seven models to choose from.**

Prices start as low as $154.95

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McCULLOCH CHAIN SAWS

Number One In World Sales

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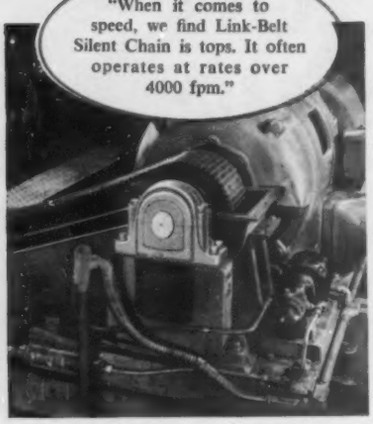
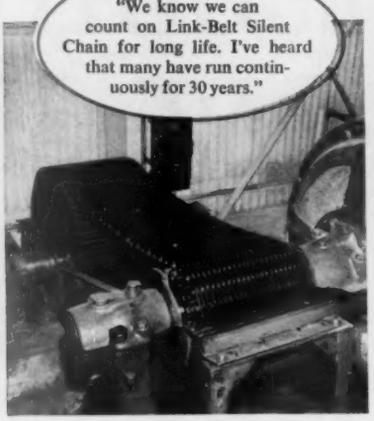
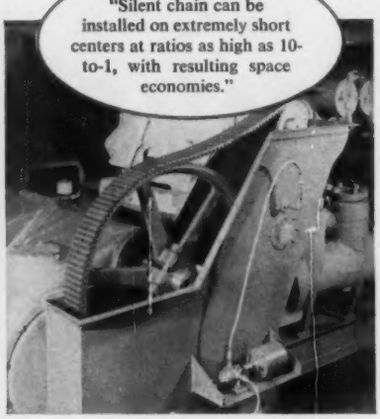
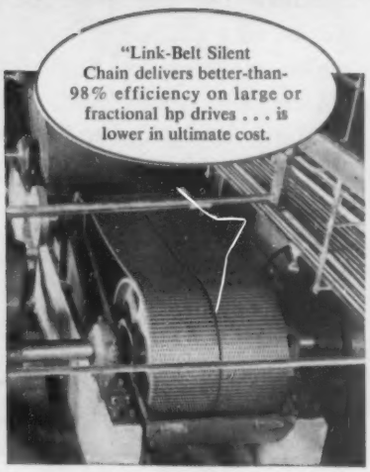
"Join me on a plant tour . . . see why

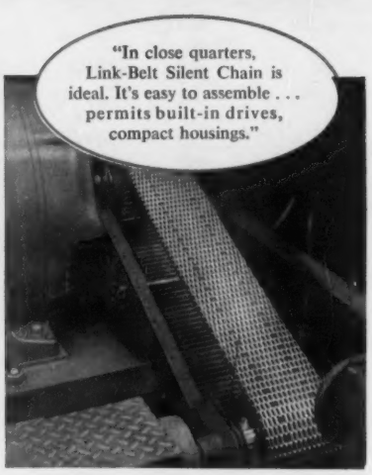
we're modernizing our drives with Link-Belt Silent Chain"











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FULL DETAILS on Link-Belt Silent Chain are offered in 88-page Book 2425. Get your copy from your Link-Belt office or authorized stock-carrying distributor. Look under CHAINS in the yellow pages of your phone book.

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Progress in Wood Utilization

Waste is being cut to a minimum through new equipment and handling techniques. Here an expert discusses the South.

By R. W. PARNELL
Chip Program Coordinator
West Virginia Pulp & Paper Co.
Charleston, S. C.

● Figures released by the U. S. Forest Service state that in 1952 some 26% of all the timber cut was *not* utilized. That represents 2¾ billion cu. ft. It is equivalent to more than 21,000,000 cords, approximately the total volume now consumed annually by the Southern paper industry.

The largest waste of wood occurred in the lumber industry, where 34% of the harvested timber wound up as waste. On the other hand, operations in the pulp industry showed only 4% wasted. In 1952 the South was wasting more of its timber than was the West or the North.

Chip production from portions of the log and tree formerly considered waste is still in its infancy in the South as compared with the chip program on the West Coast.

Longview Fibre Co. began to receive chips from sawmills as far back as 1927. Chip programs have been growing in all sections of the United States and particularly in the South in recent years. The amount furnished in 1958 was an increase of 18% over 1957's volume—5,125,000 cords of chips were furnished to the pulp mills of this country in 1958.

U. S. CHIP RECEIPTS (In Cords)

Region	*1957*	*1958*
Northeast	104,000	138,000
North Central	3,000	9,000
West	3,193,000	3,227,000
South	1,033,000	1,751,000
U. S. Total	4,333,000	5,125,000*

*18% increase over 1957

Excerpts from a talk presented recently at an Atlanta, Ga. meeting of the Southern Pulpwood Conservation Assn.

Chips and Conservation

If we could average that oft-mentioned "cord per acre per year," it would take 5,000,000 plus acres to furnish enough pulpwood to equal the chips supplied to this nation's paper mills in 1958 from what so recently was sawmill waste.

The chip purchase program is vital to the conservation effort. An American Pulpwood Assn. report shows that in 1958 some 138,000 cords of "outside" chips were received by Northeastern mills; 9,000 cords by mills in the North Central part of the country; 1,751,000 cords in the South, and 3,227,000 cords by Western mills.

These figures indicate that clear cut progress is being made in the utilization of slabs, edgings and other "fibered" left overs at most wood-using plants. Still more intense utilization from these residual products will further help to conserve and extend timber resources.

The chip program in the South is very young. So far as has been determined, the first shipment of sawmill chips was made to a Southern paper mill in 1952. This followed the installation of the South's first chip recovery system at Southern Lumber Co., Warren Ark. The resultant chips went to International Paper Co's Springhill mill.

SOUTHERN CHIP USE (Cords)

Year	*Purchased Chips*	*Roundwood*	*Chips (% of Total)*
1954	126,000	16,270,000	0.8
1955	374,000	18,014,600	2
1956	659,000	19,685,800	3
1957	1,203,000	18,579,600	6
1958*	1,900,000	18,301,000	9
1959*	2,500,000	20,000,000	11
1965*	4,000,000	25,000,000	14

*Estimate

It was estimated that at the end of 1958, 9% of the total pulpwood consumed in the South was received in the form of chips from outside sources.

Costs Lowered

Freight costs have been decreased by mills that have replaced some roundwood purchased from high-freight rate areas with chips secured at locations with cheaper rates.

The Charleston, S. C. mill of West Virginia Pulp & Paper Co. received its first car of purchased chips in July 1956. Our total chip receipts for that first year were 2,746 cords. This was less than 1% of total wood consumption. In 1957 our chip receipts

Cam Niederhof on Chips and Conservation:

The manager of wood procurement at Charleston, S. C., says—

"We are now receiving from outside suppliers about 150,000 cords of pine chips annually. Some 150,000 acres of excellently managed timberland would be needed to produce this amount of wood raw material. Many forests that have been under management for years are not yet producing at this rate per acre. For such a tract to yield a yearly 150,000 cords would require both an immense investment and many years of hard work."

amounted to 41,044 cords, roughly 8% of our wood needs. The volume of shipments grew in 1958 to a total of 109,636 cords, approximately 20% of total wood used. Present indications are that we will receive during the present year around 175,000 cords. This will amount to something over 25% of our total wood used.

During the first four months of 1959 we actually received 55,465 cords of chips, or 25% of the mill's total wood requirements.

Other Advantages

There are other advantages inherent in a chip program in addition to conservation. One is the inventory value in case of debarker or chipper failures in the mill's chip house. Also, routine repairs can be scheduled more easily with these chips on hand. Normally, we receive from 250 to 280 cars of chips each week from outside sources.

All purchased chips are delivered to the mill by rail. These cars can be held for unloading at the mill's convenience without interference to the chip supplier.

We have estimated that in 1965 paper mills in the South will be receiving 4,000,000 cords of chips annually.

In 1956 it was thought that the ultimate volume of chippable materials that would be available to the paper industry would be approximately 2,000,000 cords a year. This estimate was based on statistics showing that the sawmills in the South were producing 8 billion bd. ft. of lumber yearly. Estimating that one-half cord of usable chips could be salvaged from each 1,000 ft. sawn, it was figured that a total of 4,000,000 cords of chippable refuse was being produced annually. At that time, the industry felt that the ultimate percentage of this that could be procured economically would be perhaps 50%.

However, in the last three years many things have taken place that have materially changed this original ceiling estimate. Many lumber companies that formerly obtained lumber from numerous portable groundmills have closed down these small mills and constructed large stationary plants. Most of these are actually being built around debarkers and chippers.

Some of the smaller mills that are still in operation are installing the newer type Rosser head debarkers. Eventually, we may be able to procure almost all of the chippable by-products of the southern sawmills.

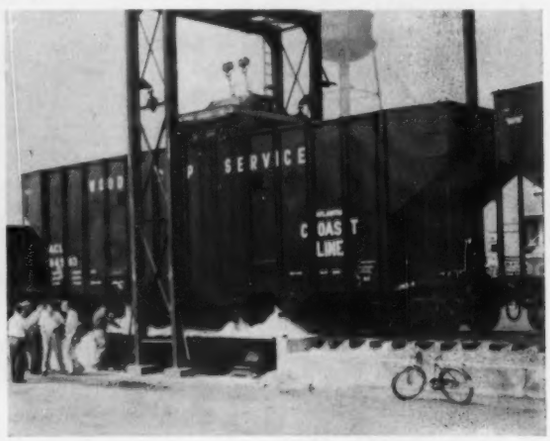
The mills are actually producing more chippable material than formerly. Some of them now bring to their mills more of the tree than previously and chip the part now sawn. In addition, they are also chipping their lowest grade logs. So, perhaps when 1965 rolls around, we will find that instead of the 4,000,000 cords of chips that we now estimate might be available, this total might have risen as high as 4,500,000 cords.

For the Future

Currently, a number of paper companies are showing interest in new developments that might increase the volume of procurable chips. The development by the Battelle Institute of the Vac-Sink method of bark-fiber separation could have far-reaching results in the field of conservation of unused timber resources. The chip-producing saw that is being tested is reported to yield up to nearly a ton of recoverable chips, instead of sawdust, per 1,000 ft. of logs sawn. The new planer attachment that produces chips instead of shavings has possibilities.

Definitely, there is a ceiling to the purchased chip potential. Some railroad men seem to have the idea that the need for pulpwood rack cars is going to decline steadily and that the "outside" chip program will grow at a mushrooming rate. Such beliefs have led to their converting sample lots of cars into chip-carrying monstrosities.

Chip procurement potentials are keyed to the lumber produced, and we doubt that the lumber production in the South will show any marked increase in the next few years. It has been almost static for the past 40 years.



LARGEST HOPPER CAR IN THE WORLD especially designed and constructed for hauling chips is one of 200 being constructed by the Atlantic Coast Line Railroad. It carries a maximum of 70 tons of chips, has a capacity of 5,400 cu. ft.

Chips From Mill Residuals To Be Used

Crown Zellerbach Corp.'s West Linn, Ore. mill will start using purchased chips this fall. This mill, which sets on an island in the Willamette River, has previously relied entirely on logs as a direct source for wood. Facilities now being installed are to provide capacity for 25,000 units of chips annually. The outside chips are to be added to the supply made from logs at the mill in the manufacture of sulfite pulp, which comprises about one-third of the plant's fiber production. The balance of the pulp produced is by the groundwood process.

The new installation will include a storage area complete with handling facilities. Western hemlock and white fir chips, produced from lumber and veneer residuals, will be delivered by truck from mills located in the Willamette Valley and Coast Range.

This sort of utilization has effectively stretched the Pacific Northwest timber supply. It is estimated that up to 1¾ billion feet of timber is annually saved from cutting in Oregon and Washington as a result of using mill by-product wood (formerly waste) as raw product supply for pulp mills.

Tree Farm Acreage Grows

The amount of timberland currently growing timber as certified privately owned tree farms increased by over a million acres during the past half year. This brings the total to 49,443,552. It is anticipated the 18-year old tree farm program will pass the 50 million acre mark later in the year.

States leading in tree farm area, with over 4 million acres each, are, in this order, Florida, Georgia, Alabama, Oregon and Washington.

Mechanized Scale-Recording Cuts Costs

New IBM mark sensing scale card system saves 500 to 700 man-hours per month, speeds processing of scaling and accounting records

By DON A. SWAN*
Forest Engineer, American Pulpwood Assn.

● Brown Co., Berlin, N.H., receives approximately 350,000 cords of pulpwood a year; about 95% truck wood and 5% rail wood. Less than one half of this wood is company operated and handled by about 15 trucking contractors from some 20 to 30 job locations. The balance is purchased in three states and Canada from some 200 to 250 contractors, many of whom have several active contracts at one time. During peak delivery seasons, as many as 6 or 7 scalers are needed at the river and lake receiving points and 12 to 15 at millyard receiving points.

Previous systems required manual calculation of net-cord contents of every scale cord, and a 100% audit at the woods dept. office. Scale cards were then handsorted and summarized by contract number for manual preparation of approximately 50 to 75 weekly invoices. All of this is now done by IBM machines. The only manual operation is performed by the scaler mark sensing the cards.

In mark sensing, pencil marks are machine read (made possible by the electric conductivity of the pencil mark and transformed into punched holes which are the type of coded information the machine deals with.

How It Works

An "ID card" is a delivery to control quotas and also helps the scaler identify origin of the wood, and the contractor or job to whom it should be credited. (Fig. 1). The "ID cards" are issued to contractors by the purchased wood buyers and the operated wood supervisors. Each truckload of wood delivered by the contractor is accompanied by one of these identity cards. The serially pre-numbered scale card (Fig. 2) records such information as load of wood, species, delivery point, contractor, trucker, scaler's signature etc.

In addition, species, delivery point and the last three digits of the car or truck registration number are mark sensed on the scale card by the scaler along with the tier length, tier heights and total discounts which he has measured.

The rest of the scaler's function is mark sensing the card serial number on the "ID card" and giving the trucker the perforated carbon copy of the scale card heading. Thus the trucker in all cases has a receipt showing all information about his truckload of wood except dimensions and volume. His receipts carries the scale card serial number, which allows convenient investigation of any load of wood about which future questions might arise.

Contract number is mark sensed on each scale card by the bookkeepers in

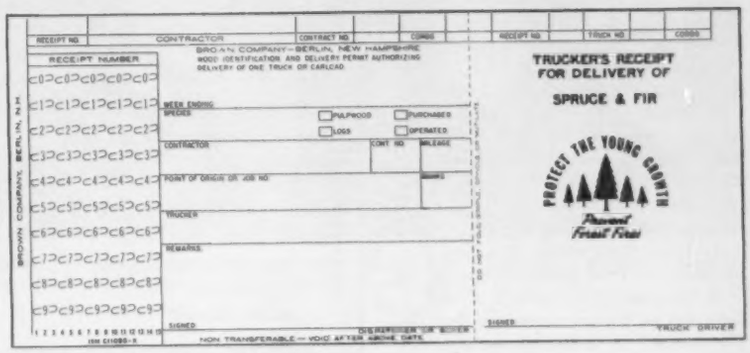


FIG. 1—Trucker's receipt for delivery of spruce and fir.

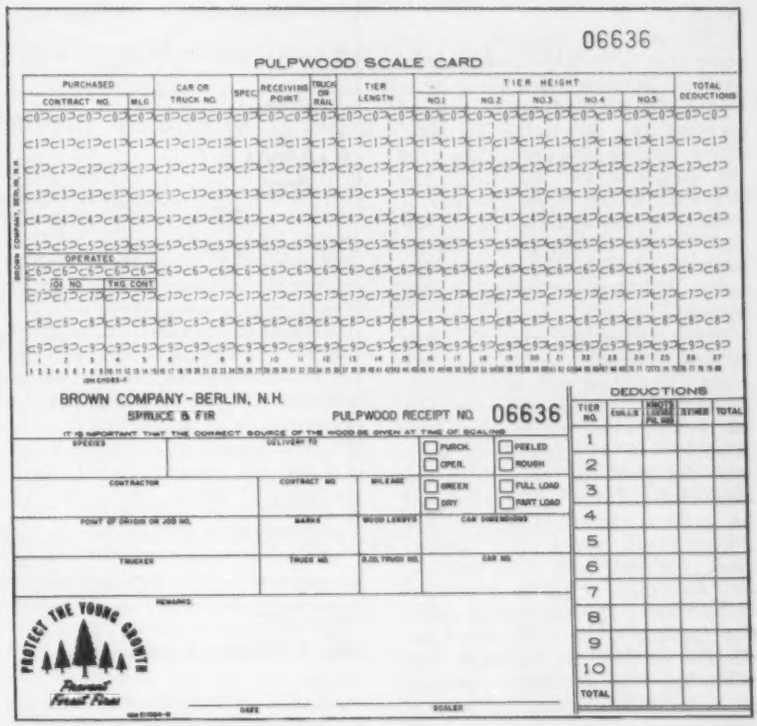


FIG. 2—Pulpwood scale card.

* In cooperation with H. E. Pettingill, chief, woods accounting; J. D. Bates, chief, woods scaling; Harry Hold, head millyard scaler, Brown Co.

the office; scale cards are then separated from the paper heading slips.

Scale cards and "ID cards" are sent to the tabulating department on a daily basis, where mark sensed information is mechanically translated to punched holes. Each card is reproduced into an 80-column accounting card which is then calculated to determine net cords for each truckload. This net cord amount is automatically converted to rough-basis cords in all case of peeled wood.

Two machine reports are prepared daily from these cards. The first is a summary of total cords by species to each receiving point, which is used to keep the pulpwood inventory records. The second is a listing by contract number of every truckload, which is kept as a daily record of deliveries and is also visually inspected for miscoding errors.

"ID cards" are matched with the accounting cards on the basis of serial number. Necessary identifying information plus net cords are reproduced from the scale card to the "ID card." This is then machine printed along the top margin of the "ID card." The right-hand section of the "ID card" is returned to the mill yard as a "tail-slip" for the trucker, giving him his net cords. The left-hand section of the card is mailed to the contractor with his weekly invoice.

At the end of each week, the cards for each individual load of wood are listed. The original copy of this weekly listing is sent to each contractor with his invoice, which has been machine printed from summary cards automatically produced along with the above listing. Every load of wood paid for on the invoice thus appears on this listing, which shows date, species, place received, scale card number, last three digits of the truck number and net cords. The only manual operation required is the bookkeeper's deductions for advances, holdbacks, etc.

Machine time required to prepare all of the above reports and invoice will vary, of course, with the volume of wood handled, but averages somewhat less than fifteen hours per week for Brown Co.'s volume.

Cost and Savings

The cost of the project consisted of about $2,000 for the original set-up expense, card design freight on machines, etc. Brown Co. was using a considerable amount of IBM equipment, and additional equipment needed for this job cost about $400 per month

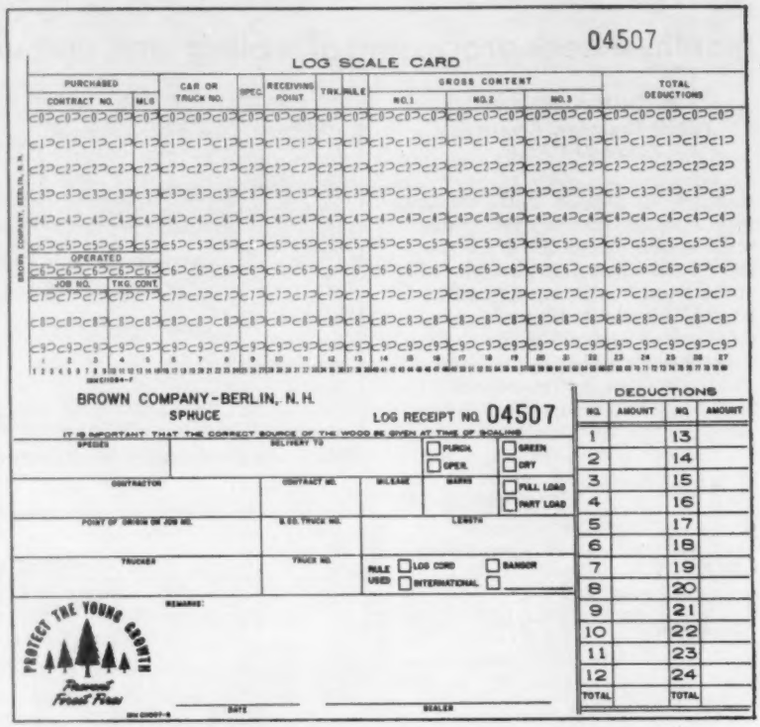


FIG. 3—Log scale card.

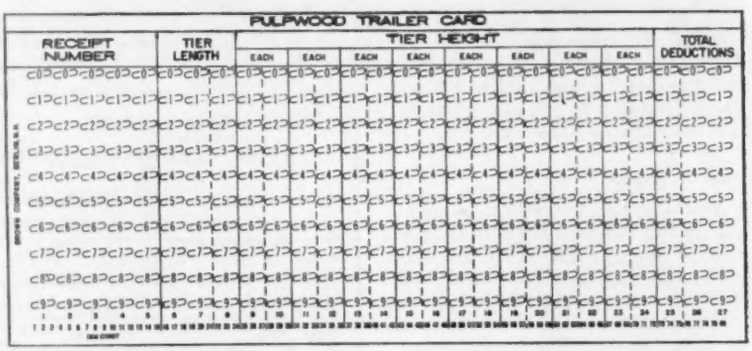


FIG. 4—Pulpwood trailer card.

rental. The savings to Brown consist of an annual average of 500 to 700 man-hours per month (scalers' and auditors' time). In addition, all of the scaling and accounting records are developed faster and more accurately.

This system appears to be another big step forward in efficiency and cost reduction. The next step which Brown is following is to extend this system into their woods production scale. This looks feasible and will save more money by eliminating more scaler's compilation time (which is often overtime) and clerical time. Once a cutter's wood is scaled and mark sensed onto IBM cards, the machine will do the rest, including printing the weekly paychecks.

The scalers using this system like it. Mark sensing a card may sound complicated but actually it means crossing out a number (for dimension) or a symbol, with a pencil. The system is virtually fool-proof. If a card is mark sensed in the wrong place or not marked where it should be, the machine will reject it.

HARVESTING 50 MILLION SEEDLINGS at Morgan Memorial Nursery near Macon, Ga. Plastic pipe irrigation system (riser pipes are vertical stakes) cuts losses. (Photos courtesy Georgia Forestry Commission.)

Pine Nursery Thrives in Georgia

Plastic pipe irrigation helps maintain steady seedling growth, features low cost installation, minimum maintenance

• The Morgan Memorial Nursery of the Georgia Forestry Commission is the source of some 50 million seedlings per year and is a vital part of Georgia's planned reforestation of its harvested tree acreage. Located on route 41, some 15 miles from Macon, the nursery grows infant trees on a tight nine-month schedule, planting the trees in March and lifting the seedlings for shipment late in the fall.

Through irrigation the nursery cuts losses in its pine tree kindergarten and maintains a steady growth through the hot Georgia summers. Engineered and installed by the Russell Daniel Irrigation Co., the system uses 26 miles of semi-rigid plastic pipe made by Triangle Conduit and Cable Co.

"Installation cost is less than any comparable underground system," says Graham F. Daniel, manager of the irrigation company," and the pattern of water coverage is better than any achieved through overhead irrigation." Co-designer and engineer of the Morgan project was W. A. Duke, Claxton, Ga.

Minimum Maintenance

"Labor-wise, one man can operate this complete system and the initial cost is less than any other combinations or a complete underground system," says Mr. Daniel. "After installation, the only maintenance would be on a long range program of sprinkler repairs and this would be at a minimum."

The Daniels system installed at the Morgan Nursery draws its water from a deep well through a turbine pump driven by an electrically-powered 200 hp pump. Main lines of 10-in. and 12-in. asbestos cement pipe feed laterals of semi-rigid pipe in sizes ranging from 2½-in. down to 1¼-in. The mains and the laterals are buried 3-ft. beneath ground well below the frost line and safe from plows and harrows which can be operated safely in both directions across the seedling growing areas.

The only steel pipes in the massive job are risers which carry water from the laterals to the Buckner 860 agricultural sprinklers, spaced 40-ft. apart on the laterals. Laterals are spaced 56-ft. apart on the mains.

The capacity of the system was dictated by the fact that the growing pine seedlings need water frequently and at a comparatively low volume, rather than the infrequent but heavy coverage required in some irrigating problems.

The Daniels system at Morgan can lay on rain at the rate of quarter-inch per hour, conservatively within the overall capacity of the machinery but safely above the requirements of the growing trees. The pumping equipment can feed water into the mains at the rate of 2,000 gpm, better than four tons per minute of operation.

Semi-rigid pipe is not to be confused with flexible polyethylene pipe. Triangle semi-rigid, which is supplied in twenty-foot lengths, has higher pressure capacities than polyethylene.

Another of its advantages is the solvent weld process. Solvent is brushed on the pipe, the pipe and fittings are quickly joined and the fusion of the materials results in a solid mass of plastic which becomes the strongest section of the piping.

Chemically, the product is polybutadiene polystyrene acrylonitrile. It is domestically produced of virgin materials and extruded into a product within any filler and one which is stable against deterioration by heat or light. It is completely non-toxic and in eight years of use has proved to have highly-desirable physical and electrical properties as well as a high degree of chemical resistance.

Light Weight, Major Advantage

Its light weight is a major advantage. The Triangle semi-rigid weighs slightly over 2 lbs. to the 20-ft. length in the 1-in. i.d. size.

The high impact strength semi-rigid pipe can be cut readily with hand or hack saw, bends moderately, can be worked (drilled, tapped, ma-

LOW COST INSTALLATION is one feature of plastic pipe irrigation system. Solvent, brushed onto pipe and tee will harden into a monolithic unit stronger than pipe.

FINISHED TEE JOINT shows reducing fitting and metal riser ready to go into ground. Pipe is flexible enough for assembly into single unit then snaked in as single piece.

chined, sanded, etc.) and is easily reusable because of quick reassembly with the solvent welds.

The semi-rigid plastic pipe experiment has been watched with interest throughout Georgia. Forest products, principally those same pines which grow at Morgan Memorial, are important to the 165,000 unit Georgia farm economy, not alone as a productive crop but in terms of conservation and reforestation looking toward a future healthy forest products business.

The Georgia Forestry Department has bought other similar installations since the Morgan system went into service. Others using these basic materials and the Daniels know-how are now in use or being built for Union Bag-Camp Paper Corp. at Bellville, Ga., Rayonier, Inc., Glennville, Ga., Riegel Paper Corp., Lumberton, N.C., the North Carolina Conservation Dept. at Morganton, N.C., the woodlands division of Continental Can Co., Hopewell, Va. and the Scott Paper Co., Mobile, Ala.

McArdle Opposes Large Single-Use Wilderness Areas; Stamm Urges More Wood Use at Portland Meeting

Opposition to turning large areas of public forests into single-use wilderness areas was expressed by Richard E. McArdle, chief of U.S. Forest Service, at the recent Citizens Conference on Pacific Northwest Resources in Portland, Ore. He said "the Forest Service is for a certain amount of wilderness and intends to preserve and protect its wilderness areas whether or not proposed legislation is passed . . . We do not favor transfer of numerous areas and substantial acreages to single use and to other jurisdictions as has been proposed by some enthusiasts." Stressing the need for multiple-use management, Mr. McArdle stated the Northwest "isn't large enough" to take care of all of the various forest uses on a single-use basis.

Wood at Highest Economic Value

Edward P. Stamm, retired vice pres. of Crown Zellerbach Corp., cited growth and utilization of every cubic foot of wood at its highest economic value as future goal of private timberland management.

He defined elements of the intensive utilization of forest resources necessary as "good road systems to salvage timber mortality and provide access for forest protection purposes and maintain logging efficiency; logging plans which give priority to salvage dead, dying and downed timber; pre-logging to increase yields in old-growth timber; repetitive thinning cuts to increase yield and improve growth and quality of residual trees; relogging; adequate fire suppression precautions including snag removal; rapid reforestation of non-stocked or poorly stocked land, and general upgrading of private lands to an over-all high level of productivity."

Mr. McArdle's recommendations for maintaining continuous growth on federally owned forests stressed (1) reducing the accumulated backlog of non-productive cutover and burned-over areas and (2) getting more access roads into areas of higher elevation to insure year-around harvest timber.

Henry J. Vaux, dean U. of California School of Forestry, urged that

forest taxation be revised to eliminate "serious inconsistencies" with forest management policies. The existing form of property taxes on timber he said, "may encourage reduced forest productivity."

To adapt taxation so it will be compatible to the growing of timber Dr. Vaux says: (1) relieve the forest owner of the need to raise cash to pay taxes when his timber is immature or when unstable, dependent industries require that cutting of mature timber be deferred; (2) adopt policies of timber valuation and assessment that will lead to an increase in forest productivity and long-term stability of timber output; (3) eliminate the sudden and substantial increases in the taxes paid by timber property which accompany rapid increases in the cost of local government.

Admiral Arthur W. Radford, former chairman of joint chiefs of staff (special assistant at Champion Paper & Fiber Co. for the past two years) told the group that if there should be a sharp upturn in Russian pulp coming to this country it may have "a political motive and political objective—not from the buyer's point of view, but from the seller's."

Admiral Radford expressed conviction that America will keep ahead of the Soviet Union in military strength, but was less certain of the results in a long-range economic race with world communism. "In the economic race lies the great danger to our future" he said. For business and industry this means "grappling with the problems of pricing ourselves out of world markets and . . . mature confrontation of the sapping disease of inflation."

Indian Service Selling 600,000 Acres of Timberlands

Timber totaling 3.5 billion feet sawmill type and 1.4 million cords of pulpwood on Klamath Indian Reservation in south central Oregon will be sold on sealed-bid basis. The sales, of land with timber, are to be made in 11 separate units ranging in area from 35,000 to 91,000 acres, aggregating 617,000 acres. The timber volume is chiefly Ponderosa pine.

The sale specifications state that purchasers will be required to manage the lands "according to sustained yield procedures so as to furnish a continuous supply of timber" and that the "management of other forest holdings should not be included in the management plan for the tribal lands." Prospective purchasers must submit a management plan three months prior to sale date and receive U.S. Forest Service approval of same to qualify. The buyer's plan must meet USFS standards and the forest land dedicated to sustained yield management "in perpetuity."

A successful bidder will receive a deed for the unit concerned. The approved management plan will be incorporated with the deed and "shall provide for a forfeiture and a reversion of title to the unit to the United States in event of a breach of conditions. The Secretary of Agriculture shall be responsible for enforcing conditions."

There appears to be no provisions specifying arrangements as to how a purchaser could sell or otherwise disassociate his ownership other than by foreclosure for nonfulfillment of contract. What would happen to the owner's equity in case of foreclosure has also not been spelled out.

Klamath Falls, a city of 20,000 population, is the only community in this entire sparsely populated region that even approaches this size. Lumber manufacturing is supplemented by one particle board plant and groundwood-type insulating board plant.

Other information can be obtained from Regional Forester, Forest Service, U. S. Dept. of Agriculture, Portland, Ore.

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Pulpwood Notes

CLAUDE GERMYN has been named gen. logging supt. for Powell River Co. Ltd. in Vancouver, B.C. Until recently he was in charge of operations at one of the company's camps on the Queen Charlotte Islands. . . . JOE CLIFFE has been made full-time logging advisor to the vice pres. for timber, HUGH J. HODGINS, Crown Zellerbach, Canada. He has been active in Canadian Western Lumber & Comox Logging Co., now a Crown Zellerbach division. WILLIAM WAINWRIGHT and WILLIAM CHALMERS, Nitinat and Ladysmith supts., will report directly to ARCHIE RAFTER, logging mgr. at the company head office in Vancouver. BRUCE KING, Beaver Cove supt., will report to MIKE POJE, who is also gen. supt. of the Courtenay area operations.

W. D. HAGENSTEIN, exec. vice pres. of the Industrial Forestry Assn., says that Oregon will continue as the nation's number one lumber and plywood producer and before long will become a leading pulp producing state as well. He estimates that the state's timber stand is 600 billion bd. ft. . . . E. P. STAMM, vice pres. for timber of Crown Zellerbach prior to retiring and now functioning as a consultant in Portland, and ROBERT SIEDLE, research director of Simpson Timber Co., Seattle, are members of an 8-man group of foresters and forest industry personnel touring Russia.

WILLIAM J. SMIDT, a veteran of 30 years' service with International Paper Co., has been appointed New York woodlands accounting mgr. He succeeds WILLIAM A. LUDWIG, who is retired after 41 years with International. Mr. Smidt joined IP as an accounting clerk in the Credit and Collection dept. He was transferred to the woodlands accounting operation as a field auditor in 1945. In 1952 he became asst. mgr. of the dept., a position he held until his recent assignment. . . . C. B. DAVIS, vice pres. (woodlands), Abitibi Power & Paper Co. Ltd., has announced appointment of C. W. R. DAY to mgr. of the Woodlands dept. at Iroquois Falls, Ont. He succeeds T. H. STONE, who is retiring on a company pension. Mr. Stone joined Abitibi at Sault Ste. Marie, Ont., in 1923 and served the company there and at Smooth Rock Falls prior to his appointment as woods mgr. at Iroquois Falls in April, 1943. Mr. Day joined the firm in 1929 and has served most of his time in Iroquois Falls. He became asst. woods mgr. in June, 1946.

McMillan ..... Nielsen ..... Godden

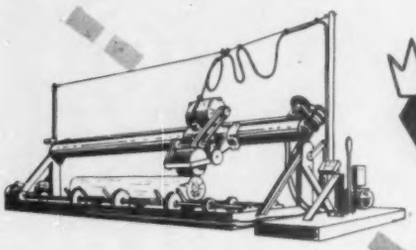
Woodlands Changes at Dryden

NORMAN MCMILLAN has been named woods consultant for Dryden Paper Co. Ltd. At the same time K. K. NIELSEN became woods mgr. and J. H. GODDEN asst. woods mgr. Mr. McMillan is a veteran woods mgr. whose experience includes 32 years with Dryden. Mr. Nielsen is a forestry graduate of the Univ. of New Brunswick and prior to joining the firm was gen. supt. for the parent company, Anglo-Canadian Pulp & Paper Mills, at Forestville, Que. Mr. Godden, a forestry graduate of the Univ. of Toronto, joined Dryden in 1955.

Dr. Hall Retires

DR. J. ALFRED HALL will retire August 31 as director of the U. S. Forest Products Laboratory in Madison, Wis. He is to be succeeded by DR. EDWARD G. LOCKE, for the past eight years chief of the laboratory's division of wood chemistry.

Dr. Hall will make his home in Portland, Ore., where he will do consulting work in the forest products field. He retires as only the fifth director in the laboratory's 50-year history. He began his Forest Service career as a biochemist on the laboratory staff in 1930, specializing on the rosin production of southern pine.



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DD-48 DoubleDuty HORIZONTAL CHIPPER

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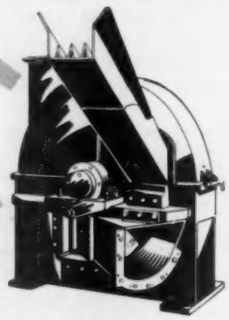

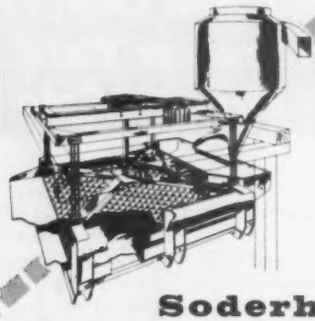

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Horizontal oscillating type with double sawdust elimination. Efficient screening for small operations.

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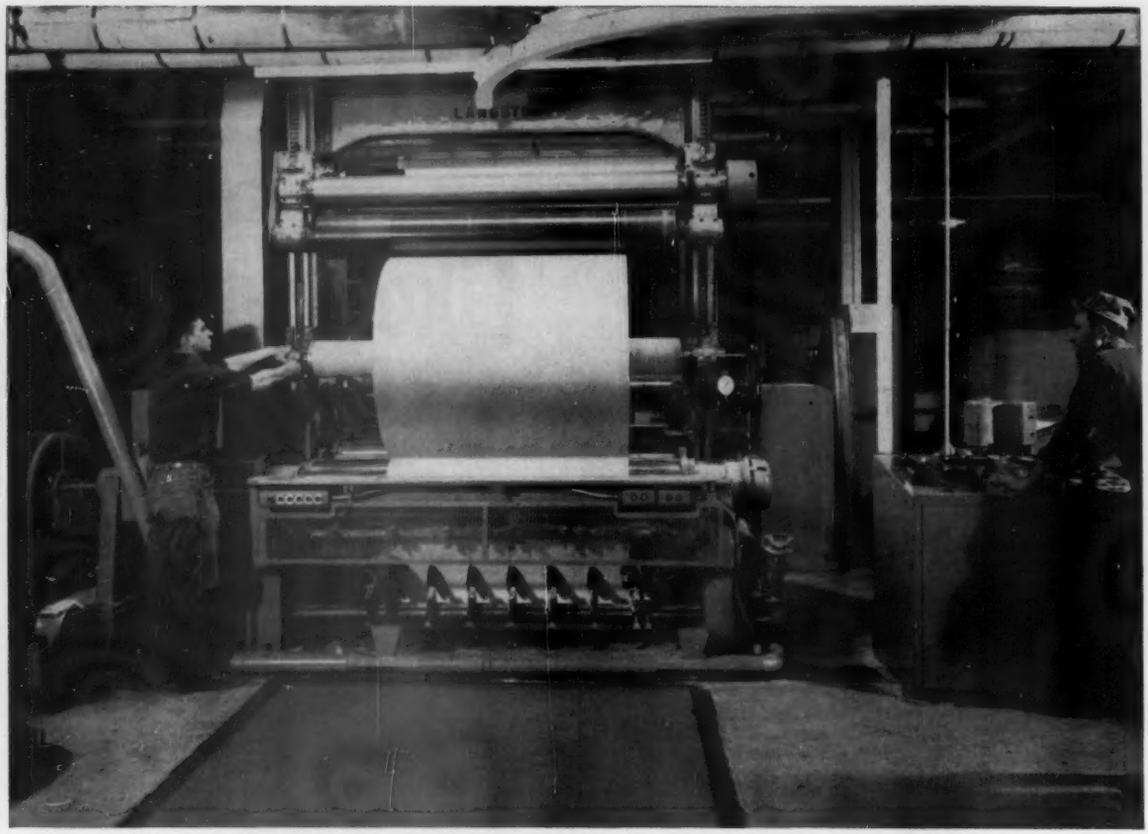


New 72-inch Type CA Langston Slitter and Winder in Marathon Corporation finishing room handles rolls up to 60 in. in diameter at speeds up to 1500 ft. per minute. Finished rolls are lowered by hydraulic drop shown in foreground.

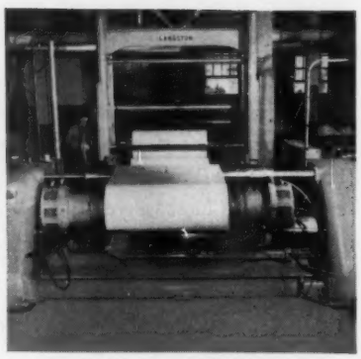
New Langston Slitter and Winder helps Marathon cut operating costs

This new Langston Slitter and Winder installation at Marathon Corporation's Rothschild, Wis., mill is already helping the company cut costs and speed processing of quality paper and board.

For example, the power-operated shaftless unwind stand virtually loads itself. No crew is needed to bull heavy shafts into place. And the Langston hydraulic roll ejector permits 1-man removal of finished rolls. These two features alone are saving Marathon several thousand dollars a year. Water-cooled Wichita-type air brakes can be operated from control console.

Besides effecting major operating economies, these Langston machines also pay off in higher quality rolls. The hydraulic rider roll control, for instance, automatically keeps nip pressure constant, regardless of the diameter or weight of the rewound roll. This insures rolls of uniform density with reduced tendency toward wrinkling or telescoping. The shear-cut slitters cut like scissors instead of a knife, shearing cleanly and keeping paper dust to a minimum. The resulting clean-edged, dustfree rolls are easier for customers to process.

Learn how you can benefit from the advantages of Langston Slitters & Winders. Write SAMUEL M. LANGSTON CO., 6th & Jefferson Sts., Camden 4, N.J.



Langston Shaftless Unwind Stand eliminates the time-consuming, back-breaking task of hoisting heavy shafts into place. The hydraulically actuated arms reach out, pick up the roll and lift it to running position—a 1-man, push-button operation.

LANGSTON Leadership...by design

HOW YARWAY BLOW-VALVES REDUCE DIGESTER OPERATING COSTS

Faster blow

Valve by valve comparisons show Yarway Seatless have up to 100% greater discharge area than some other digester blow valves of the same nominal pipe size. Result—faster discharge, lower pressure drop.

Cleaner blow

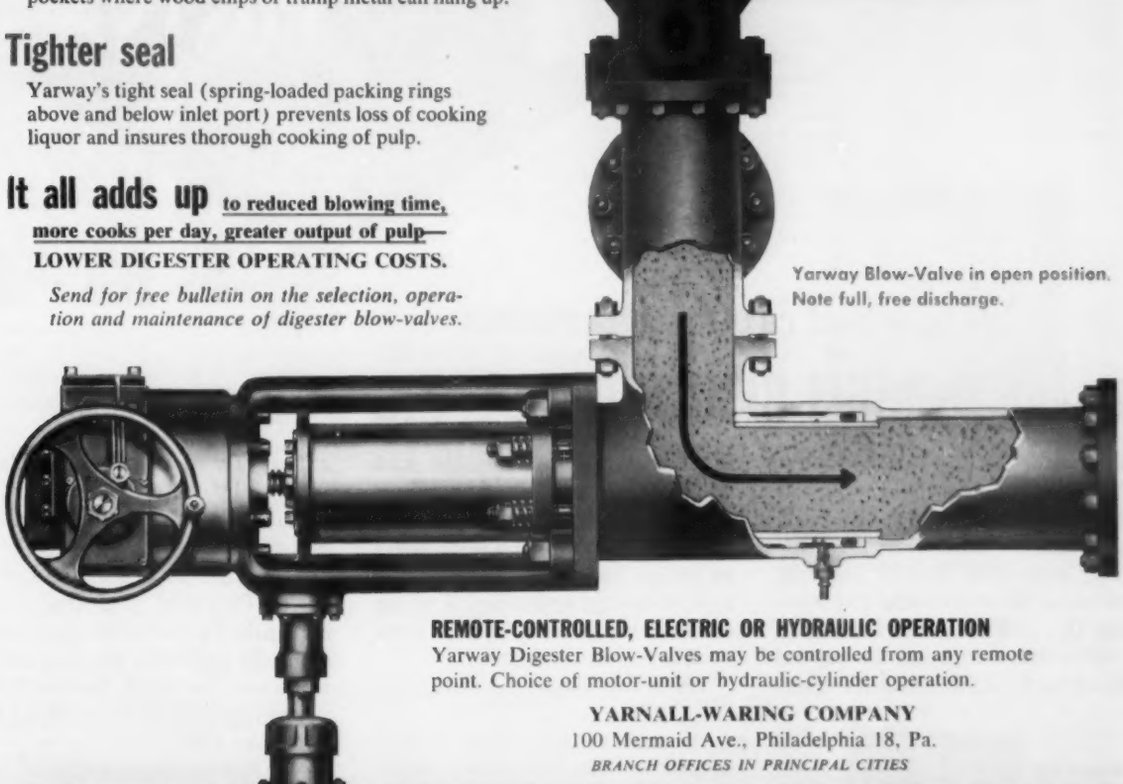
Steam purging is unnecessary since Yarway's seatless hollow-sliding-plunger design eliminates all pockets where wood chips or tramp metal can hang up.

Tighter seal

Yarway's tight seal (spring-loaded packing rings above and below inlet port) prevents loss of cooking liquor and insures thorough cooking of pulp.

It all adds up to reduced blowing time, more cooks per day, greater output of pulp—
LOWER DIGESTER OPERATING COSTS.

Send for free bulletin on the selection, operation and maintenance of digester blow-valves.

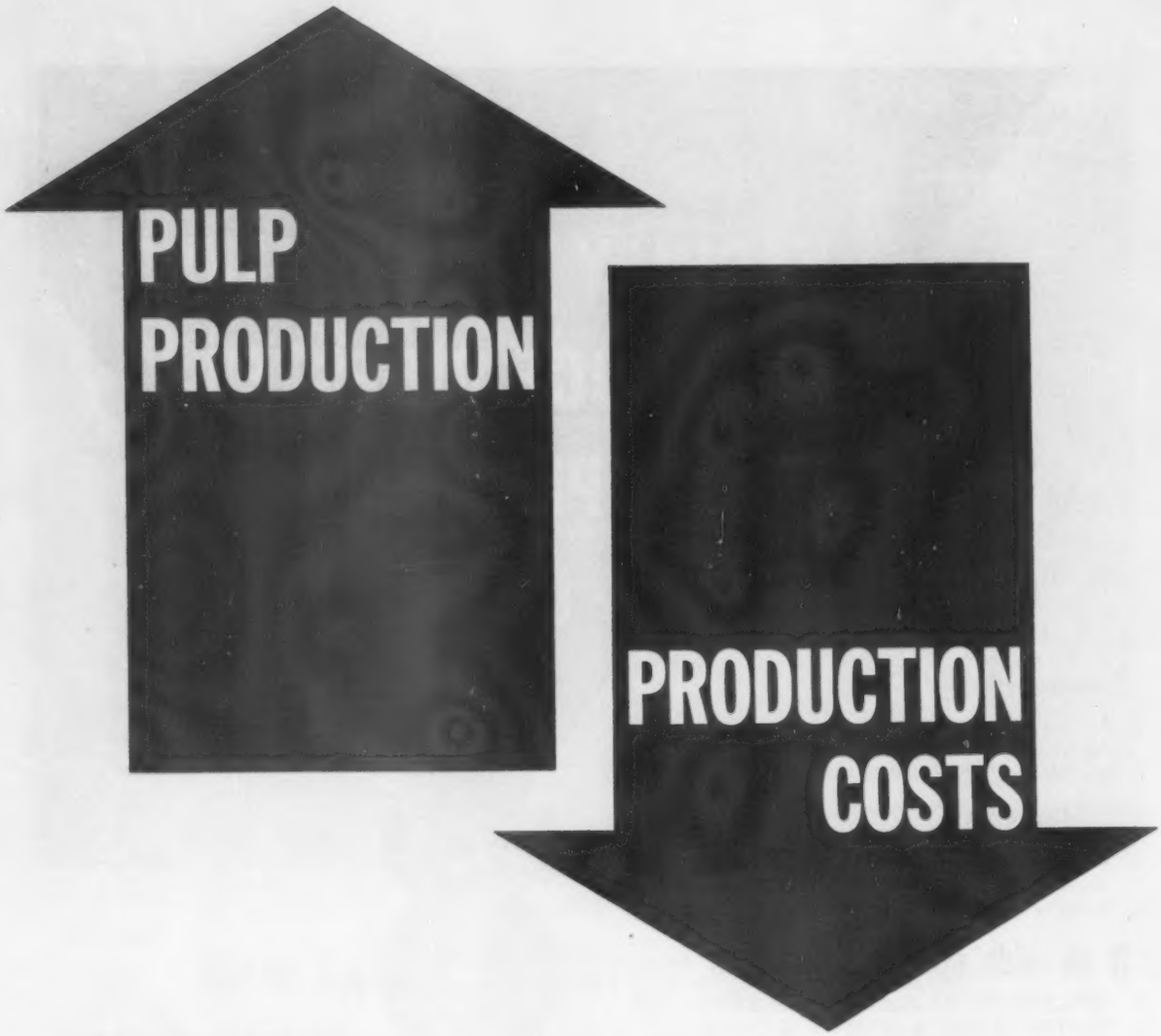


Yarway Blow-Valve in open position. Note full, free discharge.

REMOTE-CONTROLLED, ELECTRIC OR HYDRAULIC OPERATION
Yarway Digester Blow-Valves may be controlled from any remote point. Choice of motor-unit or hydraulic-cylinder operation.

YARNALL-WARING COMPANY
100 Mermaid Ave., Philadelphia 18, Pa.
BRANCH OFFICES IN PRINCIPAL CITIES

YARWAY DIGESTER BLOW-VALVES



with nominal capital investment

key: AMMONIUM BISULFITE PULPING

More mills than ever are looking at Ammonium Bisulfite Pulping as an economical way to increase pulp output. Mills that have already converted to ABP are now realizing the substantial cost savings this process gives them.

With little increase in capital investment, ABP shortens cooking time, thus reducing the cost of steam per ton of pulp while it increases digester output 20% or more. Yields from the wood itself go up too, because there are fewer rejects during screening. A wider choice of pulpwoods—soft or hard — is a bonus advantage.

The ammonia process eliminates entirely the maintenance problems caused by "liming up." Easier pollution control further reduces costs.

Another fact you should know: Allied Chemical pioneered ABP, and Allied's technical specialists can help you with detailed information as you weigh its merits for your mill. Call them in for an exploratory talk.

For specifications and local offices, see our insert in Chemical Materials Catalog, pages 435-442 and in Chemical Week Buyers Guide, pages 35-42, or write our New York office.

BASIC TO AMERICA'S PROGRESS

Allied Chemical

NITROGEN DIVISION
Dept. AA13-25-2, 40 Rector Street, New York 6, N. Y.

2819

Strictly Personal

Northeast

Engineering promotions at West Virginia Pulp & Paper Co. as announced by ARTHUR L. NOBLE, chief engineer, are ROBERT C. STAMM from supervisor of design to senior project engineer; WILLIAM E. WASSMER from project engineer to senior project engineer; SHELDON G. MADER from sponsor engineer to supervisor of design; WILLIAM T. RYER from sponsor engineer to project engineer; CHARLES MORE from structural engineer to staff structural engineer; KENNETH D. MCGRYANE from structural designer to structural squad leader; GEORGE SONDBERG from mechanical squad leader. Also, JEAN P. FATZER has been added to the staff as a mechanical engineer and CHARLES J. MCBRIDE as an electrical designer.

JEROME LEVIN is now asst. to the president of Berman Paper Corp. . . . WILLIAM J. SMIDT is now New York woodlands accounting mgr., International Paper Co., succeeding WILLIAM A. LUDWIG, who has retired. . . . PROF. HERMAN F. MARK, world renown authority on polymer science, has been named to the board of directors of Western Petrochemical Corp. . . . Changes at Deerfield Glassine Co.: W. A. WYLDE, president, retires but continues as a consultant. P. E. HODGDON continues as chairman of the board; T. RICHARD PROBST is elected president. RICHARD EMERY, asst. sales mgr., becomes sales mgr., and CHARLES HILL becomes mill mgr.

A. W. LUBBERS, president of Chemical Pump & Equipment Corp., Jersey City, N.J. heads an organization of seven sales engineers who will represent Sutorbilt Corp. in northern New Jersey and New York east of Syracuse, including New York City and Long Island. . . . HIRAM LEROY SMITH JR. has joined Bowen Corp. of Cambridge, Mass., as chief engineer in the Chemical div. He recently returned from France, where he was Stone & Webster Co. project engineer for a chemigroundwood pulp mill for Société F. Beghin, Corbehem, Pas de Calais. He had previously worked on the chemiground pulp mill for Great Northern Paper Co. . . . JOHN H. DOHERTY is now mgr. of marketing research for Union Bag-Camp Paper Corp. . . . RALPH H. BORNSTEIN has left New Haven Board & Carton Co. to join Chas. T. Main Inc., as an engineer. . . . HORACE B. FABER JR., is now a research associate for Eaton Dikeman Co. . . . PAUL B. CORNING is now project engineer for Parsons & Whittemore Inc. . . . WILLIAM V. HANSON is now staff asst. in the manufacturing dept., Oxford Paper Co. . . . ARTHUR W. PLUMMER, formerly with Kimberly-Clark, is now associate director of research and development, Hudson Pulp & Paper Corp., South Windham, Maine.

Riegel has realigned its New Jersey division, changing its name to the Specialty Products div. to more completely describe its operations. G. LAMONT BIDWELL steps

Donlan ..... Blankinship

Donlan Becomes V.P.; Blankinship is Adviser

LOUIS CALDER, JR., president of Perkins-Goodwin Co., international pulp and paper marketing-management organization, announces election of FRANCIS X. DONLAN as a vice president. Frank Donlan has had over 20 years' experience in the industry, and served two and a half years in the U.S. Air Force during World War II. He joined Perkins-Goodwin in 1950 as a pulp sales representative covering middle Atlantic states out of the New York headquarters.

Mr. Calder also announced that STANFORD G. BLANKINSHIP, who observed his 65th birthday July 23, is retiring from active service. At the request of the company he will continue as a vice president and director, serving in an advisory capacity to the Pulp Dept. Stan Blankinship was for 25 years with the Brown Company in Berlin, N. H., and from 1929 to 1941 was manager of the Brown Co.'s pulp mills. He is a past president of the Supts. Assn. and the U. S. Wood Pulp Importers Assn. He joined Perkins-Goodwin in 1945 as vice president, and head of pulp sales.

Howard C. Peterson, Jr. To New Sales Post

St. Regis Paper Co. announces that HOWARD C. PETERSON, JR., who has been with the Kraft Division, has been appointed to the new sales post of corporate account executive. He will work with major accounts of St. Regis to acquaint them more fully with the diversified line of products offered by the various divisions. Mr. Peterson, who will serve on the executive sales staff and report directly to ARCH CARSWELL, executive vice president—sales and marketing, joined St. Regis in 1952.

David B. Kuhe Heads Brazil Mill Operations

. . . as vice president in charge of manufacturing and construction for the new Lutcher Celulosa S.A., one of several companies with U.S.A. support, which have built or are building new mills in Brazil. F. LUTCHER BROWN, acting for the new company, said Mr. Kuhe's initial duties will be concerned with the construction of a new pulp mill, to be located 400 miles southwest of Sao Paulo, Brazil. The actual site is 200 miles west of Curitiba, near the town of Guarapuava at the confluence of the Iguacu and Jordan Rivers. For the past three and one-half years Mr. Kuhe was vice president in charge of manufacture with the Hudson Pulp and Paper Corp. He had previous experience in Mexico and in other U.S.A. companies as operations and development manager.

Dr. Donald T. Jackson Elected Vice President of Hammermill

Since 1954, Dr. Jackson has been technical director and continues to head this department. President DONALD L. LESLIE said his election was "recognition for outstanding contributions." Dr. Jackson directed overall phases of Hammermill Paper Co.'s $20,000,000 growth program at Erie, Pa., the largest in its history. He headed research which led to development of its exclusive Neutracel pulping process, one of the industry's important advances. Born in Bannock, Mont., Dr. Jackson was son of a gold miner. He graduated from Montana State College, received his ph.d. from U. of Pittsburgh, doing work also at Mellon Institute. In 1933 he joined Hammermill as chemist. He was a head of laboratories, then of all research before taking over all technical direction.

Strictly Personal

William B. McGoldrick Celebrates 40 years with Price & Pierce

Mr. McGoldrick is general manager of Price & Pierce, Ltd. and director of Price & Pierce Sales Co., Inc. His friends held a private dinner party for him at the Rose Restaurant on 52nd St. on August 3rd. Mr. McGoldrick is also president of the Assn. of American Wood Pulp Importers.

Bidwell ..... Hartford

Riegel Realigns New Jersey and Carolina Divisions

G. LAMONT BIDWELL, formerly vice pres. and mgr., is now vice pres. and gen. mgr., Specialty Products div. At the same time, DR. C. E. HARTFORD, vice pres. and mgr. became vice pres. and gen. mgr. of the Carolina div. . . . Also at Carolina, GEORGE ROOT is named coating technologist. He was with Potlatch Forests.

up as vice pres. and gen. mgr.; CHARLES E. SCHAEHRER becomes vice pres. of Riegel and sales mgr. of the division, also continues as mgr., packaging materials sales. . . . DR. W. A. SCHENK, formerly Upper Mills mgr., advances to the new post of mgr. of paper production with responsibility for all paper machine production and finishing in the Warren Glen, Hughesville, Riegelsville and Milford mills. DR. L. A. MOSS, production mgr., of the Milford mill, is now mgr. of manufacturing services.

WILLIAM F. NEWBOLD has been appointed director of research for the Brown Instruments Division, Minneapolis-Honeywell Regulator Co. He succeeds WALTER P. WILLS, director since 1955, who has been named technical advisor to the director of engineering, a new post.

A native of Philadelphia, Mr. Newbold was graduated from Princeton University and joined Brown Instruments in 1948. Mr. Wills, also a native of Philadelphia, was graduated from Lehigh University. He has been with Brown Instruments since 1936.

H. CLAY MANGLES has been appointed special asst. to LARRANCE E. GRAHAM, sales mgr., Fine Paper div., International Paper Co. . . . ROY C. CHARRON has joined Stein, Hall & Co. as adhesive specialist, Technical div. . . . EDWARD A. BROOKS JR. has been appointed production control supervisor of the Chemical Fine Paper & Board div., Standard Packaging Corp. . . . CHARLES W. SMALL succeeds HERBERT R. GRANSTROM, who has resigned, as customer service supt. . . . A. P. MITCHELL, senior vice pres., Riegel Paper Corp., has been appointed to new post of director of marketing, continuing as senior vice pres.—Maurice R. Castagne.

Knowlton Names Keeney

FREDERICK C. KEENEY has joined Knowlton Bros. at Watertown, N. Y., as asst. to the vice pres. for production. A ph. d. graduate of the Institute of Paper Chemistry, he has been since 1951 associated with Weyerhaeuser Co. in Oregon in various capacities. His last position was that of technical director at the Springfield mill.

James M. McClung, Plant Engineer for Oxford

Mr. McClung succeeds LEON A. FIELD as plant engineer at the Lawrence, Mass. mill of Oxford Paper Co. Mr. Field recently retired. A graduate of the engineering school of Tufts Univ., Mr. McClung was formerly asst. plant engineer.

Rand ..... Masterman

Promoted to IP Executive Staff

GEORGE H. RAND has been named asst. to Vice Pres. STUART E. KAY, International Paper Co. Mr. Rand, who has served since 1954 as divisional mgr. for the Northern Mills, will move to the New York, N. Y. offices, where he will assist Mr. Kay in operation of the Northern div. and in special assignments.
Succeeding Mr. Rand is ROSCOE C. MASTERMAN, formerly asst. divisional mgr. at Glens Falls. A graduate of the Univ. of Maine, he joined International in 1933 at the Otis mill.

Great Northern Paper Celebrates Safety Record

. . . at its East Millinocket, Maine mill, where on July 1 employes and townspeople alike formally marked the 1,000,000th man-hour without a lost-time injury.

Shown with the Award of Merit Banner given by the National Safety Council are (l to r) THOMAS M. BARRY, mill mgr.; HENRY S. STONE, Employers' Liability Assurance Corp. Ltd.; GEORGE GODDARD, who accepted a plaque on the part of the employes, and M. C. MCDONALD, president.

SAYS WHITER AND BRIGHTER WITH®

UNITANE

Titanium Dioxide

PUTS WHITENESS UP WHERE IT OUGHT TO BE!

In paper boxboard for cartons, Unitane O-110 Titanium Dioxide provides the whiteness that builds sales for products of all kinds. The attraction of added brightness and the look of extra cleanness do the trick! Ask your Cyanamid Pigments representative about Unitane O-110.

CYANAMID

AMERICAN CYANAMID COMPANY, Pigments Division
30 Rockefeller Plaza, New York 20, N. Y.
Branch Offices and Warehouses in Principal Cities

Strictly Personal

William Beckett on Hammermill Board

WILLIAM BECKETT, president of Beckett Paper Co., Hamilton, O., since 1958, has been elected a director of Hammermill Paper Co. He has been a state senator in Ohio, mayor of Hamilton, O., twice and city councileman six times. But he has also worked for 26 years at the Beckett firm founded by his grandfather.

Southern

WILLIAM L. (BILL) SCHNORBACH has been appointed mgr. of Continental Can's new bleached board mill at Augusta, Ga. Bill has been mgr. of special process and project engineering for Gair and has worked on several expansion programs, including design and engineering of this new mill. He is a chemical engineering graduate of the Univ. of Michigan, has spent his entire professional life in the paper industry. The 350-ton mill will be in operation in 1960.

Keene Joins Impco

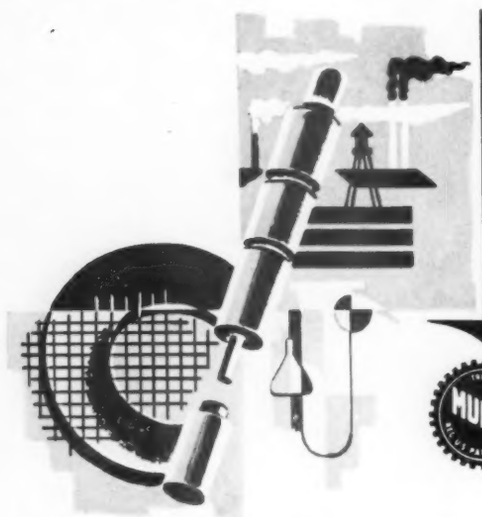
HAROLD KEENE, familiar to many Southerners, has joined Improved Machinery Inc. as sales representative. He was formerly sales engineer for Goslin-Birmingham and is a graduate of M. I. T.

JAMES A. PEACOCK and JOHN F. WARREN have been named finishing shift supervisors at Scott Paper's Mobile, Ala. mill, and PRICE WILLIAMS assumes duties of roll shipping foreman. LEROY STEBER has been promoted to sheet and pulp shipping foreman. . . . Truscon Laboratories has appointed W. J. SAMMONS sales representative for northern Florida with headquarters in Jacksonville. The firm specializes in corrosion-resistant coatings and waterproofing. . . . Torrington Co.'s Bearing div., has opened a branch office at 244-246 Walker St. SW, Atlanta, Ga. Its Southern district engineer, LARRY PAINE, will service North and South Carolina, Georgia, Tennessee, Florida and Alabama.

KEITH SAUNDERS, formerly waste treat-

John A. Lyden, Ast. Mgr. Of Manufacture in South for I.P.

Mr. Lyden has been manager of individual Southern Kraft mills for International Paper Co. since 1939—successively at Mobile, Ala., Georgetown, S.C., Natchez, Miss., and back to Mobile in 1955. Like some other famous names in this industry, he trained in the famed old Cherry Valley Mill of West Virginia. He joined IP in Bastrop, La. in 1927 as a chemist. In his new duties he will be assistant to CARLIE L. CRAIN, vice president of International and manager of manufacture for all Southern mills. One of Mr. Lyden's sons, C. P., is supt. of IP's Turlock, Calif., single converting plant.



behind this trademark...

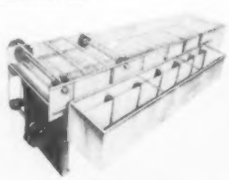
lies a world of experience!

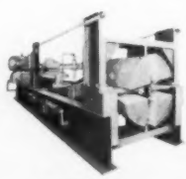
To the paper industry we offer a specialized service based upon 75 years close association with the needs of paper manufacturers. Write today for complete information, proposals and recommendations on any items in which you are interested . . . no obligation for our Engineering Department recommendations.

Other MURCO Equipment

• MURCO Multi Knife Chipper Discs • V-Spouts for Pulpwood Chippers • Mechanical Feed Wastewood Chippers • ReChippers • Chip Crushers • Stainless Steel Flat Screens • Level Vibrating Chip Screens • Knot Screens • Barking Drums • Quick Opening Gate Valves • Roll Heading Machines • Hydraulic Roll Lowering Tables • MURCO Collard Pneumatic Windershafts • Mechanical Windershafts • Power Dam Gate Hoists — plus GRID Unit Heaters and Blast Heaters.

MURCO Multi-Knife Chippers


MURCO Stainless Steel Flat Screen


MURCO Hydraulic Wood Splitter

D. J. MURRAY MANUFACTURING CO.
MANUFACTURERS SINCE 1883 • WAUSAU, WISCONSIN

PUGET PULP

IS WHITE

Bleached Sulfite Pulp

PUGET SOUND PULP & TIMBER CO.

BELLINGHAM • WASHINGTON

UNIFORM

CLEAN

STRONG

Strictly Personal

ment plant operator at West Virginia's Covington mill, has been promoted to field engineer with the general Maintenance & Construction dept. At WestVaCo's Charleston, S.C. mill, LUNSFORD H. LEWIS has been named to the product development staff working on new applications and improvements for kraft paper. He will concentrate on stretchable Clupak. Mr. Lewis was formerly quality service representative for the Kraft div. in the Midwest. He will be replaced by PETER ILLING. E. RANDOLPH OGLESBY has also joined West Virginia, handling personnel functions for the Wellsburg, W.Va., and St. Louis, Mo. multiwall bag plants.

DAN PICHON JR., onetime mgr. of industrial relations for Dierks Paper Co. at Pine Bluff, Ark., will be industrial and public relations mgr. of Tennessee River Pulp & Paper Co. LAWRENCE COKER, formerly with the H & W div. of Scott Paper in Mobile, Ala., has been appointed senior engineer at Tennessee River.

New faces have joined Crossett Paper Mills: JESSE GALBRAITH, Univ. of Arkansas graduate, has become a mechanical engineer, as has Louisiana Polytech alumnus HOWARD O. REEVES. CHARLES LAMB, chemical engineering graduate, has joined the research division.

The scholarship foundation of North Carolina State's pulp and paper technology school has awarded $32,825 to 57 applicants enrolled in this course—a positive step in creating future papermakers. . . . JOHN PENINGER, known widely in the South as former mill agent at I.P.'s Natchez mill, has been named asst. treas. of International Paper Co. He is a veteran Southern kraft man, having started his career at the Louisiana mill in 1932. Prior to promotion he was agent at Springhill, La. . . . JAMES E. MCCAFFREY, vice pres. in charge of woodlands for I.P.'s

St. Amant Joins O-I

ROBERT V. ST. AMANT, vice pres. and gen. mgr. of Tomahawk Timber Co. in Ely, Minn., has joined the Mill div. of Owens-Illinois Glass Co. as mgr. of logging and personnel for the Woodlands div. He will headquarter in Jacksonville, Fla. He had been with Tomahawk Timber since 1947 and prior to that was a member of the U. S. Forest Service.

Kiddie ..... Coy

E. J. Kiddie Named Asst. Gen. Mgr., Jacksonville

. . . for Owens-Illinois Glass Co.'s Paper Products div. Succeeding him as production mgr. is PETER M. COY, for the past two years supervisor of corrugating, carton assembly and statistical quality control for the Libbey Glass div. Mr. Kiddie served as production mgr. at box plants in Madison, Ill., and Detroit prior to moving to Jacksonville.

NEW

JET ZONE® LABORATORY and Pilot Plant HIGH VELOCITY DRYER

For the Laboratory of the Paper Manufacturer

- widens the scope of your pilot operation.
- makes initial runs to test market.
- allows wide range of paper formation and finish.
- opens up new avenues for product development.
- extremely adaptable as a dry and cure unit.
- permits exploration of the new coating techniques.

Write for complete specifications

Available in two models to handle 24" web. GAS OR STEAM FIRED!

Model L 4
- Two four-foot long drying zones.

Model L 8
- Two eight-foot long drying zones.

JOIN THE INDUSTRY...INVESTIGATE THE NEW TECHNIQUE OF HIGH VELOCITY DRYING

"TAKING THE MYSTERY OUT OF DRYING"
WOLVERINE EQUIPMENT COMPANY
31 MAIN ST., CAMBRIDGE 42, MASS.

A Leader in High Velocity Drying Since 1946

New in South . . .

BENNY F. HOWELL, graduate of the Univ. of Tennessee, will represent Arnold Hoffman & Co. Inc. in the Southeast. The firm is an expanding manufacturer of organic chemicals.

Southern Kraft div., has been named a member of the advisory council of the National Outdoor Recreation Resources Review Commission.

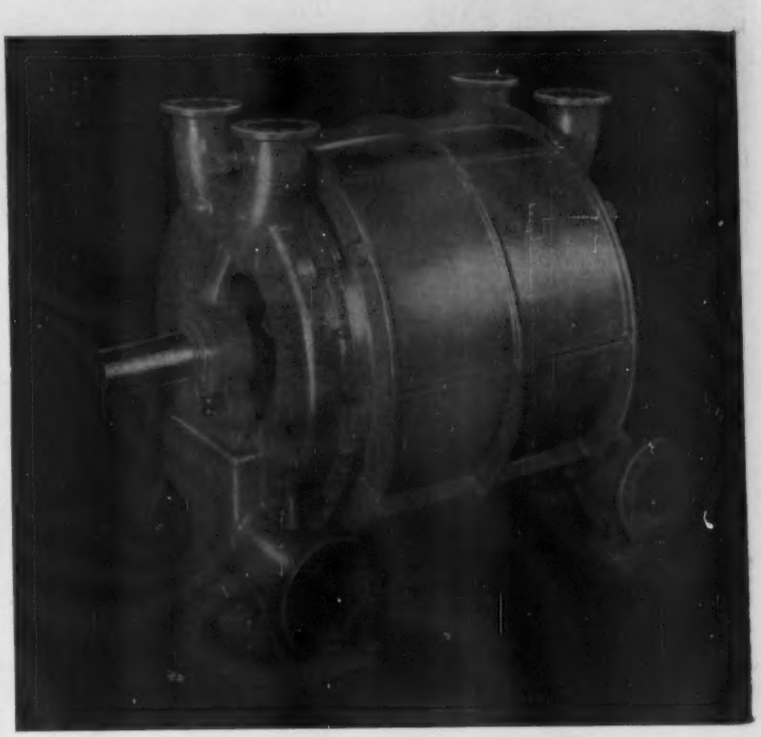
W. R. OWENS, paper mill supt. and asst. to the mgr. of North Carolina Pulp Co., has been promoted to the newly created position of production mgr. Mr. Owens joined North Carolina Pulp in 1946 as supervising chemist. H. B. CAMPBELL, asst. paper mill supt. of No. 1 machine, has been promoted to paper mill supt., C. H. PAINTER, JR., tour foreman, is now asst. paper mill supt. on No. 1, and relief tour foreman JAMES HAMILTON has been promoted to tour foreman. . . . M. A. BELL, formerly representative for Carthage Machine Co. in Birmingham, Ala., has formed Bell-Machinery Co., representing various machine, chipper knife, screen, debarking and chipper manufacturers. His address: 914 North 19th St., Birmingham, Phone: FA 3-6841. . . . C. F. LORD has been named advertising supervisor of R. G. LeTourneau Co.

JOHN W. (JACK) RICKER, formerly E-Z Opener district sales mgr. in Chicago, has been promoted to the newly created position of sales promotion manager of Gulf States Paper Corp. He will operate out of Tuscaloosa. . . . The H. D. WARNERS have deeded their stately Tuscaloosa home to the Univ. of Alabama. Mrs. Warner, former president and now chairman of the board of Gulf States Paper, is an avid collector of antiques. The home contains many art treasures and priceless antiques. . . . E. J. GAYNOR, III, president of Brunswick Pulp & Paper Co., recently celebrated his 35th anniversary with Scott Paper Co. He began his career as a broke hustler in 1924.—William F. Diehl Jr.

Midwest

DAVID W. FLOTOW has been appointed research engineer in the technical dept. of Consolidated Paper Co., Monroe, Mich. He was formerly with Hercules Powder

This New Nash Vacuum Pump Offers Four Separate Suctions and Vacuums Simultaneously



The Nash 5308-A has four separate suction inlets, each of which functions independently of the others. This offers the machine operator great flexibility, since these may be used in any desired combination to produce a variety of capacities and vacuums.

Picture below shows simple drive possible and flexibility of piping permitting capacities to exactly fit requirements of different sections of the paper machine.

NASH
ENGINEERING COMPANY
SOUTH NORWALK, CONNECTICUT

Meet Huyck's
MANSUY

Paul G. Mansuy is Huyck's Assistant Sales Manager. A graduate of Lafayette College, he has been with Huyck for 7 years. Paul and the Sales Engineers who work with him are proud of their reputation of being on call twenty-four hours a day to meet the felt requirements of every papermaker in the United States.

HUYCK FELTS
First in Quality . . . First in Service Since 1870

Co. in Atlanta, where he was technical service engineer. . . . The new gen. sales mgr. of Planet Corp., Lansing, Mich., is ROBERT E. FRENCH, formerly western sales mgr. At the same time, ROBERT S. MILLER, formerly eastern sales mgr., was named asst. gen. sales mgr. . . . HENRY H. HEMENWAY has been named director of research and engineering for Graver Tank & Mfg. Co., a div. of Union Tank Car Co. . . . RICHARD J. MOSER has been named asst. supt. of the papermaking div. of KVP Co., Kalamazoo. He joined KVP in 1952 in the research laboratory and papermaking div. In 1957 he was transferred for one year to the pulp and paper mill in Espanola, Ont. Since returning to Kalamazoo, Mr. Moser has been assigned as a staff asst. to the Wax and Printing divisions.

PALMER C. DOLPH JR. has been named director of industrial relations for all Ohio Boxboard Co. operations. He joined the company in 1955 as director of labor relations and was promoted to asst. director of industrial relations in 1957. . . . Dow Chemical Co. has announced the advancement of FRED K. QUIGLEY JR. to the position of staff mgr. of coating materials. He was formerly asst. mgr. of Coatings Technical Service and succeeds E. K. STILBERT, recently named a product group vice pres. of Dow Chemical International Ltd. S.A. . . . RICHARD MARKHAM has been named technical service rep. for the

Branagan Succeeds McCune as IS-WPI Head

THOMAS E. BRANAGAN, former Illinois publisher and veteran Associated Press newsman in Chicago for 12 years, has been appointed secretary-coordinator of the Information Service, Wisconsin Paper Industry. He succeeds JOHN T. MCCUNE, who resigned to take a position with the Bergstrom Paper Co., Neenah, Wis.

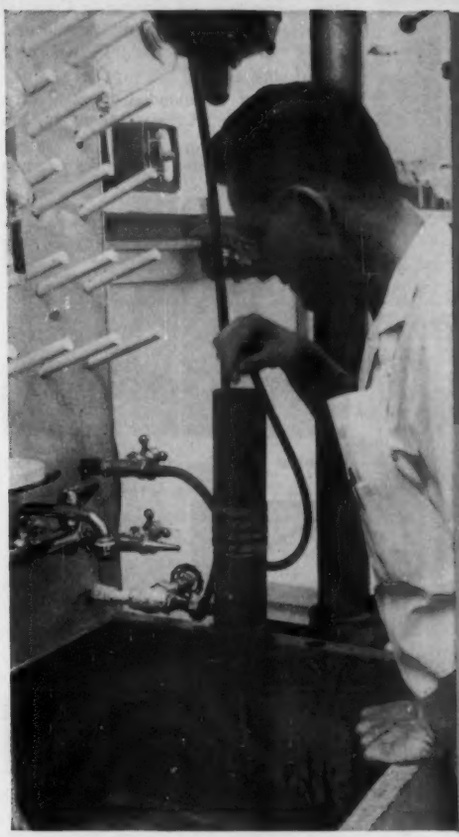
Announcement of the appointment was made by DR. W. R. HAZELTON, vice president and general manager, Rhinelander Paper Co. and chairman of the Information Service.

The service, with headquarters at 104 N. Commercial St., Neenah, Wis., was established 10 years ago by major Wisconsin pulp and paper manufacturers as a joint community and public information bureau.

Mr. Branagan, 38, recently disposed of his interest in the *Villager*, a community news-magazine, and two associated weekly publications serving the Skokie and Niles Township, Ill., area.

Huber Lab Report:

THESE TWO HUBER TESTS ARE HIGHLY IMPORTANT TO YOUR PAPERS



COMPREHENSIVE STUDY of oversized particles *(left)* using a nest of several screens: namely, 80, 170 and 325 mesh. (TAPPI Standard Procedure T645m)

PARTICLE SIZE TESTS, using a hydrometer method *(right)*, determine particle distribution to about one micron. Analysis of finer particles is made with special centrifuges.

Many important innovations for the paper industry have come from the Huber Clay Laboratories. Among these are the VISCONTROL process for assuring uniform viscosity in clay and the new line of Hydrafine Clays.

The comprehensive quality control tests of our Huber, Ga., laboratory are well-known throughout the paper industry... and our labs maintain a close relationship with customers by rendering technical service. We can duplicate all of the essential stages of paper making from sheet making to finished filled or coated paper. We will be glad to discuss with you how *our* lab services can improve *your* product.

J.M.HUBER CORPORATION 630 THIRD AVENUE, NEW YORK 17

Mines & Plants: Huber, Ga.; Graniteville & Langley, S.C.

HUBER

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Paper div. of Kelco Co. He will service the central states from the Chicago office and handle the Kelco Algin products used extensively in the paper industry.

JESSE H. TRASK, resident mgr. of Shawano Paper Mills, has been named advisor to top management. He is succeeded by ROBERT L. LEAF. Mr. Trask began his career with Wausau Paper Mills and for many years served in a supervisory capacity. He joined Hennepin Paper Co. in Little Falls, Minn. as gen. supt. in 1945, becoming resident mgr. of Shawano in 1950 and in 1954 was named vice pres. in charge of production. Mr. Leaf was formerly vice pres. of research and development. . . . ERNEST COWELL and ROBERT W. HEAD have been named staff associates in the Quality Control Dept. of Allied Paper Corp. Mr. Cowell was formerly with West Virginia Pulp & Paper Co., while Mr. Head was formerly employed by the Ecusta Paper Div. of Olin Mathieson Chemical Corp. . . . MARTIN L. CASE has been appointed asst. mgr. of International Harvester Co.'s Melrose Park, Ill. works. He was formerly supt. and succeeds EARL P. DACY, named manufacturing mgr. of the Australian subsidiary. . . . EDWARD C. RICHARDSON has been named Chicago div. sales mgr. for U. S. Industrial Chemicals Co.

RUSSELL P. DOUCET, formerly of Berlin, N.H., and for the past three years New England sales representative for the Bermico div. of Brown Co., has been named sales representative for the Midwest territory of the manufacturer of fiber pipe and conduit. . . . CHARLES GEHR has been made plant mgr. of Container Corp. of America's Lake Shore mill in Chicago. . . . HOWARD L. HAMPEL has been named staff asst. to the supt. of the carton plant of Diamond Gardner Corp., Lockland, Ohio. AUSBEN MOSES JR. has

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Thomson ..... Rigby

Bendetsen ..... Wright

New Duties for Three Champion Vice Presidents

Champion Paper & Fibre Co. has reported a new four-man advisory board to the president, new duties for three executive vice presidents and the election of a vice president for finance.

Comprising the advisory board are four former senior officers: H. W. SUTER, HERBERT T. RANDALL, W. M. BENZING and JOHN P. OSBORNE. All have been honorary vice presidents. Mr. Randall and Mr. Suter continue to serve as directors. At the same time, DWIGHT J. THOMSON was named exec. vice pres., converting products group; HENRY W. RIGBY, exec. vice pres., corporate development and international group; KARL R. BENDETSEN, exec. vice pres., operations group, and BENJAMIN V. WRIGHT JR., vice pres., finance.

William J. Garrity, Vice Pres. and Sales Mgr.

. . . for Allied Paper Corp., Kalamazoo, Mich. A veteran paper man, Mr. Garrity was formerly mgr. of Carolina Paper sales for Riegel Paper Corp. Prior to his association with Riegel, he served 18 years in Chicago as vice pres. and sales mgr. for Munising Paper Co.

been advanced to maintenance engineer. . . . Ohio Injector Co., Wadsworth, Ohio, has announced a division of its field sales organization into two regional operations. CARL G. LINK has been named eastern regional sales mgr. and will be responsible for all operations in the eastern half of the U.S. R. F. DAUENHAUER becomes western regional sales mgr. with Chicago as his headquarters.

L. A. STRAUBEL SR., 93, of Green Bay, Wis., founder of Straubel Paper Co., died

PIMA President Names Committee Members

A. C. MCCORRY (St. Regis Paper Co., Tacoma, Wash.), president of the Paper Industry Management Assn., has named two industry leaders to represent PIMA on a joint industry career guidance committee.

They are WALTER MOREHOUSE of Nopco Chemical, Newark, N. J., and C. IVES GEHRING, mgr. of the Pulp & Paper div. of Sealright-Oswego Falls Corp., Fulton, N. Y.

Four other representatives, two each from APPA and TAPPI, will complete the group, which has been formed to dramatize the pulp and paper industry to high school students.

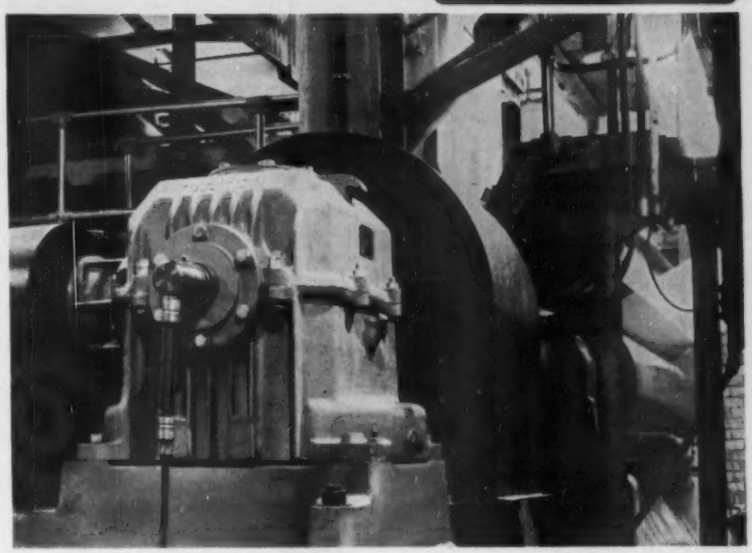
Eminger Takes New Quarters

ROBERT L. EMINGER, formerly sec.-treas. of the Superintendents Assn. (now PIMA), has taken up residence at the Pick-Miami Hotel in Dayton, Ohio, following disposition of his home and furnishings in Miamisburg.

"Bob" became associated with the Superintendents as secretary in 1924. He assumed the duties of treasurer in 1928 and held both offices until his retirement in 1944. During his tenure, the association's business was conducted from his Miamisburg home.

DAVID BROWN

at work around the world



This Canadian installation is typical of the cooperative service of David Brown companies around the world. Write for details.

...HELPING TO SMOOTH THE WORK OF A SMOOTHING PRESS!

It always matters how you gear a new installation such as this smoothing press at Rolland Paper Company's St. Jerome, Quebec mill. The gear in this case is a David Brown 17" spiral bevel unit — one of many used on the new machines by Millspaugh, famous for paper industry equipment.

This modern right angle drive installation can run continuously, hour after hour. Its 4 to 1 ratio will transmit 200 hp at 2,000 rpm pinion speed — with a high (98%) efficiency. These compact and sturdy spiral bevel gears are made in sizes from 6" to 60" by David Brown Industries.

The popular fan-cooled Radicons are also widely used in the paper industry — specified by original equipment manufacturers. They have learned Radicon's ability to withstand extremes of temperature, dust, dirt and rain — with initial low cost, and low maintenance.

Immediate delivery on Radicons 3" to 14" all standard ratios from 5:1 to 60:1. Radicon complete drives supplied by all authorized David Brown factory branches and distributors.

DAVID BROWN, INC.

999 Beecher Street, San Leandro, California
6025 Atlantic Blvd., Maywood, California
1224 S.W. Morrison St., Portland, Oregon

recently after a short illness. . . . GEORGE WAEGENER has been named supervisor of industrial engineering at Hyster Co.'s Danville, Ill. plant. . . . W. R. "DICK" SPENCER has been appointed sales representative for the South Central territory of Orr Felt & Blanket Co. He succeeds the late GEORGE WITHAM. . . . West Virginia Pulp & Paper Co. has named SHELTON J. JONES to the position of staff asst. to the mgr. of the St. Louis, Mo. plant. He joined the company in 1952 and for several years worked on the development of Kraftsman Clupak extensible paper at the Charleston, S.C. mill.

Heads Mead's Product Development Div.

ALLYN C. BEARDSELL has been named director of Mead Corp.'s new Product Development div., Cincinnati. He was formerly president of Container Laboratories Inc. The division's plant is now being equipped and staffed. Mr. Beardsell was at one time with Hinde & Dauch in packaging operations and research.

DR. DAVID G. BRAITHWAITE, vice pres., has been named head of commercial development of Nalco Chemical Co. . . . He was former head of the Catalyst div. . . . FRED BARBER has been named director of manufacturing and technical services for the Gardner div. of Diamond Gardner Corp., Middletown, Ohio. . . . JAMES K. AMES has been named to the newly created position of mgr. of field sales for Colton Chemical Co., a division of Air Reduction Co. . . . At the Wisconsin Rapids div. of Consolidated Water Power & Paper Co., MAX HUGHSON has been named to the new position of technical mgr. JAMES SCHAD succeeds Mr. Hughson as technical supervisor, and JOHN H. BARRETTE has been named asst. supt. of yard and fiber production.

MAJ. GEN. FREDERICK J. DAU, credited with modernizing the Air Force supply system, has joined Champion Paper & Fibre Co. as special consultant to Karl Bendetsen, vice pres. for pulp and paper manufacturing. His assignment will be in areas of inventory control, storage and distribution and movement of supplies, materials and end products. . . . HENRY GRINGASS, chief coating operator and spare boss machine tender at the Escanaba, Mich. div. of Mead Corp., has 39 years of service at the Michigan mill. Exec. Vice Pres. George Pringle of Mead, a 32-year man himself, presented ruby-set service pins to Mr. Gringass and to 24 others who had attained 25 years of service or more.

Promoted by Staley

DR. LEONARD F. BARRINGTON has been named director of applications research for A. E. Staley Mfg. Co. He succeeds JAMES P. CASEY, who has resigned to join the staff of Union Starch & Refining Co. Dr. Barrington was formerly head of Staley's industrial products development group in applications research.

JOHN GRETTUM, chemical engineer, has transferred from the Chillicothe, Ohio div. of Mead to Escanaba. . . . JAMES W. FRANKLIN, director of purchases for Celotex Corp., and his wife died in an

accident at their Evanston, Ill home in late July. Mr. Franklin had been with Celotex 10 years and prior to that was with United States Gypsum. . . . Three trainees have been promoted to management positions at the Gardner div. of Diamond Gardner Corp., Middletown, Ohio: ROBERT H. SCHWINN, analyst in the market research dept.; E. THOMAS LEE, chemical engineer in research and development, and LYLE RASICOT, a management post in the industrial relations dept. of the Match div.

ROBERT D. MORSE, plant engineer and asst. to the vice pres. in charge of manufacturing, becomes mgr. of manufacturing for Consolidated Paper Co., Monroe, Mich. New technical mgr. is WILLIAM LUNSFORD, formerly a research chemist. F. B. GRUNWALD, supt. of mills No. 3 and 11, becomes plant mgr. of the South Side div.; he is succeeded by HARRY NOLAND, a former assistant. GEORGE BARON, asst. supt. of mills No. 3 and 11, is the new plant mgr. of the entire North Side div. Other appointments at Consolidated include ALVIN DUVALL as supt. of plants No. 5, 6, 7, 8 and JAMES DALTON as papermaking consultant.

JAMES S. EVANS has been elected vice pres. and gen. mgr. of Wrenn Paper Co., Middletown, Ohio. He has been associated with Mead Corp. (the parent firm) 13 years, became Wrenn's mill mgr. in 1958 and acting gen. mgr. on the death of J. J. HALLOWELL March 20. . . . After 47 years with Peninsular Paper Co., Ypsilanti, Mich., Mill Supt. JOSEPH J. ELY has announced his retirement. He began his career as a machine room worker in 1912, became foreman in 1932 and has been supt. for the last 23 years. His position, however, stays in the family. His son JOHN ELY, a 25-year employe of Peninsular, succeeds him as supt. The younger Ely has been asst. supt. since 1951.

CARLTON B. SMITH, director of service for Allis-Chalmers Mfg. Co.'s Industries Group, died July 6 in Milwaukee at the age of 63. He had been service director since 1957. Mr. Smith is succeeded by THOMAS J. HANLEY, asst. mgr. . . . In another A-C appointment, GEORGE A. SAAR becomes asst. to J. L. SINGLETON, vice pres. of the Industries Group. He was previously mgr. of the electrical dept. at the Norwood, Ohio works. . . . Adell Chemical Co., Holyoke, Mass., has named M. H. Baker Co. of Minneapolis as distributor of d-i Lestoil for the paper industry in Minnesota and Wisconsin.—Don W. Zeigler

Pacific

DR. R. F. SULTZE JR., quality control director for Simpson Paper Co., at Everett, Wash., transfers to Seattle as section chief of pulp-paper at Simpson's Central Research dept.; JOHN V. GOULD, senior project engineer at Simpson Paper,

QUALITY-CONTROLLED

VersaTILE are manufactured in many sizes and shapes from S & E dies to meet rigid S & E specifications for absorption . . . compressive strength . . . size . . . distortion . . . glazing . . . acid solubility.

ECONOMICAL

VersaTILE LININGS and TANKS save you money in many ways. Their initial cost is no more than that of less suitable materials. Maintenance costs are very low. Their resistance to acids and alkalies assures uniform, clean stock.

CUSTOM-DESIGNED

Each VersaTILE installation is designed in accordance with applicable ACI, CRSI Codes, and other recognized standards, to meet your specific chemical, mechanical and loading requirements. Erection is always performed by skilled, direct-employed crews.

Include VersaTILE *in your Bidder's List*

SINGLE RESPONSIBILITY CONTRACTS . . . *anywhere in the world.*

SERVICE & ERECTION CO.

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Designers and Builders of VersaTILE Linings and Tanks

PULP & PAPER — Strictly Personal

moves to Central Research as section chief, engineering research. . . . GEORGE W. HOLT, mgr., market development, has been appointed as mgr., of new product development for Fibreboard Paper Products. BERNARD P. ALTICK resigns as vice pres. of Fibreboard but remains with the firm as a consultant.

FRED J. WELEBER, 51, asst. mill mgr. at Publishers' Paper Co., died July 15. . . . REED O. HUNT, president and chief exec. officer of Crown Z, is elected to the board of directors of Crocker-Anglo National Bank in San Francisco. . . . FRANK N. YOUNGMAN, board chairman of Crown Z Canada becomes a member of the Transamerica Corp. board of directors. . . . JOHN GILBERT moves from gen. sales mgr. to gen. mgr. of Zellerbach Paper at San Francisco. . . . LAWRENCE KEGAN promoted from staff asst., long-range planning, to mgr., marketing research at Crown Z headquarters.

Promoted at Crown Z Camas

MAX BROWER is promoted from project engr.-general to plant engr. at Crown Z Camas, Wash., a position previously held by JACK MILLER who is now asst. res. mgr. of Antioch, Calif. division.

Western-Waxide men move up: WARREN THOMAS, plant supt. at North Portland to production mgr. at Los Angeles; EDWARD LUKOWSKI, asst. printing supt., to plant supt. at North Portland. . . . Key CZ personnel qualifying for "Old Timers Club": WILBUR LOWNDES, chief engineer of central engineering at Seattle, 30 yrs.; JOHN DENHOLME, coated paper supt. at West Linn, 30 yrs.; TOM GOODWIN, test and inspection supervisor, technical dept. at Camas, 30 yrs., and both asst. res. mgrs. at West Linn, CLARENCE ENGHOUSE, 35 yrs., GLEN KING, 25 yrs. . . . CHARLES YOUNG, asst. to the pulp mill and wood mill supt. at CZ St. Helens mill, is now converting-shipping supt.; GEORGE ANDERSON moves up to asst. paper machines supt., and PETE TARANOFF, asst. paper machine supt., becomes paper machine supt. at the St. Helens mill.

THOMAS H. TAYLOR, son of CECIL TAYLOR, who is gen. mgr., manufacturing, of Oregon Pulp & Paper Co. and Columbia River Paper Mills, married PATRICIA ANNE SHERIDAN June 21 in Portland, Ore. . . . ROBERT HAMILTON, formerly of

Morris ..... Beaton ..... Hall

Managerial Promotions at Crown Z Mills

R. R. MORRIS, resident mgr. of the Lebanon plant since 1957, becomes asst. resident mgr. of the big Camas div. W. O. BEATON, technical asst. for tissue machines at Camas, is the new resident mgr. at Lebanon. And HOWARD C. HALL, asst. supt. for converting, finishing and shipping at the St. Helens div., moves up to asst. resident mgr.

Full Sail!
Full Speed!
-let the spindrift fly!
The incoming tide of business is stronger. The time has come to put on sail. Water is deeper over the shoals and you can square away for the port of profit once more if—
if your plant has been balanced,
if your power load has been adjusted,
if mechanical steps have been synchronized,
if factory additions and equipment have been arranged for.
If not, the Engineer can still help you to come to port on the rising tide a little sooner and more profitably... That is his service to you.
THIS MESSAGE IS REPEATED FROM OUR AD OF A QUARTER CENTURY AGO—AND IS EQUALLY IMPORTANT TODAY. AGAIN, THE TIDE HAS TURNED—IS YOUR PLANT SHIPSHAPE TO MOVE AHEAD SWIFTLY WITH THE INCREASING FLOW?
J. E. SIRRINE COMPANY • Greenville, South Carolina
Engineers Since 1902
A DEPARTMENTALIZED ENGINEERING ORGANIZATION SERVING • BUSINESS • COMMERCE • INDUSTRY

Rhinelander Paper Co. of Rhinelander, Wis., joins Western-Waxide's San Leandro packaging research lab as applied packaging supervisor. . . . A. R. GREEN promoted from treas. to vice pres. of Simpson Timber Co., Seattle, and ROBERT B. HUTCHINSON moves up from comptroller to treas. . . . E. W. "STACE" CAREY, who became vice pres., marketing, of Fibreboard Paper Products last January, becomes member of the board of directors. . . . PETE PETERSEN of Hercules Powder's technical staff, has rejoined the West Coast office at Portland, from which he was transferred to the Milwaukee office more than three years ago; CLARENCE HANFORD moves from Portland to the Hercules home office at Wilmington, Del. . . . ROBERT W. EUSTES is promoted from asst. mgr. of the San Francisco div. to mgr. of the Northwest div. of Walworth Co., Seattle; he replaces ROBERT CONWAY JR., who has transferred to Atlanta as mgr. of the Southeastern div.

DICK MILLER, senior engineer, has been named asst. plant engineer at the Pulp div. of Weyerhaeuser Timber Co., Longview, Wash. He succeeds JIM BUSCHING, who resigned to become construction supt. at Gulf States Paper Co., Demopolis, Ala.

U. M. DICKEY, formerly president of Soundview Pulp Co., has retired as vice pres. and director of Scott Paper Co. at the age of 82. . . . Crown Zellerbach has transferred REX MORRIS from res. mgr. at Lebanon to asst. res. mgr. at Camas. Louis H. Blackerby.

Startup of J-M plant at Klamath Falls, Ore.

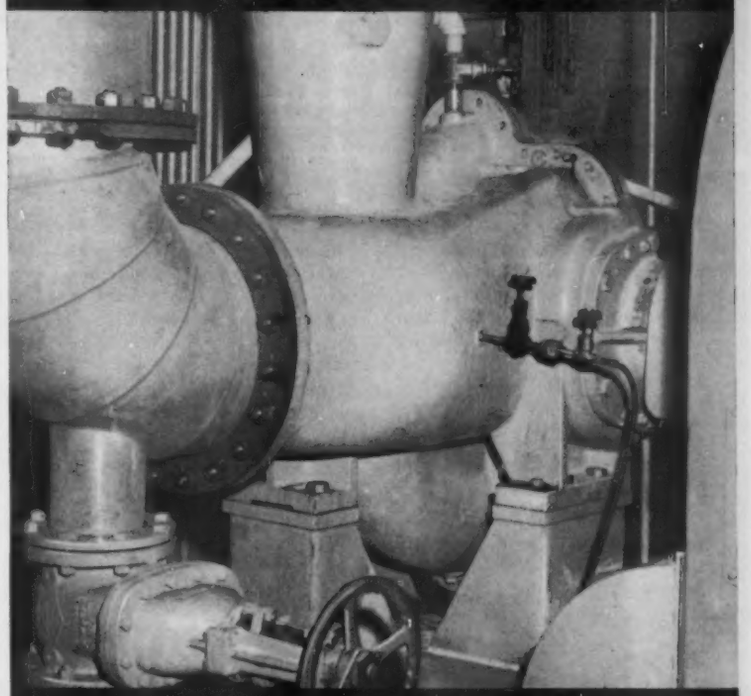
Dedicating Johns-Manville plant producing insulating board products from lodgepole pine at Klamath Falls, Ore. (l. to r.) GOV. MARK HATFIELD who pushes official "start-up" button; W. H. GRAHAM, plant mgr. who previously held same position at J-M's Natchez, Miss. plant; A. R. FISHER, J-M chairman & president; W. R. WILKINSON, vice pres.

Management Changes for Gaylord, Western-Waxide

Recently announced is a series of management changes in the Gaylord and Western-Waxide divs. of Crown Zellerbach Corp. Remaining gen. mgr. in charge of Gaylord is LLOYD MERWIN SR.

Reporting to Mr. Merwin are three new Gaylord asst. vice presidents; W. G. HUNT, formerly mgr. of converting plant

Another WARREN Fan Pump



. . . . . an unusual installation

One of the two WARREN type 18-DB-32 double suction dual volute fan pumps installed at St. Regis Paper Co., Bucksport, Maine . . . an unusual fan pump installation. Notice the side mounting of this bottom suction unit. This specially engineered mounting helped cut piping costs and saved valuable floor space for St. Regis. And because the pump cover can be moved off oversize dowel pins in a horizontal plane, rather than lifted off, the side mounting offers especially good accessibility for a pump of this size. Many such special arrangements are available from Warren.

Here are some of the companies that are using Warren Fan Pumps

DIERKS PAPER CO.
Pine Bluff, Ark.
24-DB-22—16,000 GPM at 30 ft. head

FIBREBOARD PAPER PRODUCTS CORP.
Antioch, Calif.
(6) 20-DB-22—13,000 GPM at 39 ft. head

GULF STATES PAPER CORP.
Demopolis, Ala.
16-DB-20—10,000 GPM at 155 ft. head

HUDSON PULP & PAPER CORP.
Palatka, Fla.
20-DL-22—12,500 GPM at 80 ft. head

ST. REGIS PAPER CO.
Bucksport, Me.
(2) 18-DB-32—12,500 GPM at 200 ft head

WARREN

CENTRIFUGAL SCREW RECIPROCATING GEAR

WARREN PUMPS, INC. WARREN, MASSACHUSETTS

PP-44

engineering and development, becomes asst. vice pres. for manufacturing and engineering; EDWIN J. SPIEGEL Jr., asst. to the vice pres. and gen. mgr., is asst. vice pres. for administration, and M. M. JAMIESON, gen. sales mgr. for the Shipping Container div., is named asst. vice pres. for sales.

In the Western-Waxide div. M. A. BARR, asst. gen. mgr. for production, was made divisional gen. mgr. with headquarters in San Leandro, Cal.

R. L. APPLING, asst. gen. mgr. for sales, becomes asst. gen. mgr. and continues in charge of sales. E. A. MITCHELL, asst. gen. mgr. for administration in San Leandro, is new asst. vice pres. for packaging in San Francisco.

Mill Men Will Frolic

The Paper Mill Men's Club Hi-Jinks, biggest and usually noisiest social event of the industry's year in Southern California, will be held Sept. 25 at the Oakmont Country Club, Glendale.

The program usually consists of a full day of golf, softball, horseshoes, other sports, followed by a banquet and entertainment.

Every year's crowd is bigger than the last, and this year is expected to be no different in that respect.

The mill men are hosts to the wholesalers and jobbers for the event. WILLARD F. J. TAYLOR of Johnson, Carvell & Murphy, is general Hi-Jinks chairman this year.

AIRFLOAT TABLE

Air under pressure, flowing up under the load, provides the "lift" for light-as-a-cloud, breeze-free movement. Just a push of the hand sends paper stack skimming—no drag—no creep—it *glides* on a film of air, wherever you want it to go, without the slightest vertical misalignment of the sheets.

The secret of the overwhelming popularity of LAMB Airfloat Tables in pulp and paper mills and other paper handling establishments lies in the spring-operated ball valves set into the table top. A load placed on the surface depresses the ball valves, allows low-pressure air to escape under the load, providing a film of rapidly moving air between load and table. Available for manual operation or use with mechanical-type pusher. Unit table construction provides complete versatility of arrangement in setting up a conveyor line. Tables built for a lifetime of satisfactory service.

Write for descriptive folder

LAMB-GRAYS HARBOR CO. Inc.

HOQUIAM, WASHINGTON, U.S.A. • PHONE: GEneral 8-1000

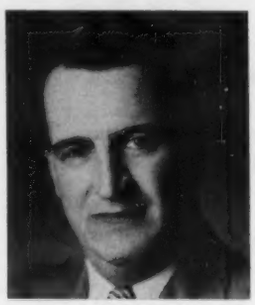
Canada

HAROLD S. FOLEY, chairman of the board, Powell River Co., Ltd., Vancouver, B.C., has been appointed one of the lay governors of Notre Dame Univ. in South Bend, Ind., the first Canadian to be so honored. . . . H. R. MACMILLAN, chairman of the finance committee of MacMillan & Bloedel, Vancouver, B.C., has given $50,000 to the Univ. of British Columbia for a graduate scholarship fund in honor of the recent visit to the university of Queen Elizabeth and Prince Philip. The scholarships will be for graduate work in any field at UBC. . . . H. M. S. LEWIN, vice pres., Bowaters Corp. of

Advanced in Howard Smith Sales

ALLAN P. R. CONLIFFE has been named asst. to the mgr. of pulp and newsprint sales for Howard Smith Paper Mills Ltd. He will continue at the executive offices in Montreal and will also serve as asst. to the gen. sales mgr. of Donnacona Sales Corp.

A native of Cornwall, Ont., Mr. Conliffe belongs to a family that has had more than 40 members employed at one time or another by the Howard Smith organization. His grandfather was with the old Toronto Paper Co. The new asst. mgr. was formerly pulp shipping supervisor at Cornwall.



Dominion Engineering Names Robert P. Vaughn

. . . sales engineer in the Paper div. A graduate mechanical engineer, he has been with Dominion Engineering Co. Ltd., Montreal, for 10 years, serving in various production and sales capacities. In his new position he supervises all sales engineering for western Canadian mills, working through the firm's Vancouver, B. C. office. Mr. Vaughn also serves several mills in Quebec. On the West Coast he is assisted by W. D. Parkinson, while in Quebec he is aided by R. J. FUTCHER.

William A. Bain Named Sandwell Senior Engineer

Mr. Bain's appointment to the senior staff of Sandwell and Co. Ltd., Vancouver, B.C., Canada, is announced by P. R. SANDWELL, president. A University of British Columbia graduate in mechanical engineering, Mr. Bain has for 30 years been with Alaska Pine & Cellulose Ltd., and its predecesor B. C. Pulp and Paper Co. He was responsible for the design and construction in modernization of the Woodfibre, B.C., mill, and he directed the modernization at the Port Alice, B.C., mill. Latterly, as manager, Cellulose Division, Alaska Pine & Cellulose Ltd., he was responsible for the operation of the Woodfibre and Port Alice mills.

North America, recently addressed a meeting of the Financial Analysts Societies in Montreal, and declared he could think of no commodities for which there would be greater demand in future than "paperboard for men's goods and paper for men's minds."

J. S. GOODYEAR, vice pres. and sec.-treas. of Anglo Newfoundland Development Co., has been made vice pres., finance; C. R. TITTEMORE, mill mgr., has been named asst. gen. mgr., with ROBERT BROWN, gen. supt., stepping into Mr. Tittemore's previous job. . . . Other

Campbell ..... Johnson

Honored on Retirement

ROY L. CAMPBELL received a silver tray and testimonial scroll recently from the board of directors of Canadian International Paper Co. on his retirement as secretary after nearly 40 years' service. The presentation was made by VERNON E. JOHNSON, president. R. W. BECKET, vice pres. and gen. counsel, has assumed the additional duties of secretary, Mr. Campbell had been active in the industry nearly 45 years, having joined the old Riodan Paper Co. in 1917.

IT'S *what's behind*
THE BALL THAT COUNTS!

...and Bituminous, too!

BEHIND BITUMINOUS is unlimited supply and ever increasing technology of utilization. *No other usable power source is backed by both these important characteristics.*

You can base your constant power-fuel needs on bituminous with confidence—B&O Bituminous, of course! ***Ask our man!***

BALTIMORE & OHIO RAILROAD, BALTIMORE 1, MD., PHONE: LEXINGTON 9-0400

SIDEWINDER OPERATOR
totally enclosed, low friction, powerful

NYLON BEARINGS
low friction, long lasting

CHEVRON PACKING
never needs adjustment

SHAFT
straight through, stainless steel or monel

DISC
one piece, cast in choice of materials

HYCAR SEAT
never needs replacement

BODY
cast iron or cast steel

the MONOFLANGE MARK II

the valve that industry demanded*

*The motivating force behind the creation of this, and other new products soon to be announced, was the obvious industry need for this type of equipment. Henry Pratt MARKET ORIENTED valves are all new for 1960.

Usually, the most significant contributions to industry stem from ideas born of experience. Such a contribution is the Pratt MONOFLANGE MARK II—a really different valve. The difference is in design and conception—for here is a valve designed to meet the ever increasing need for a compact and sensible 150# valve. Drop-tight and ideal for throttling service, the MONOFLANGE MARK II is a versatile valve. Even the manual and automatic operators are new—all enclosed, powerful, rugged, and reliable. For a high quality, reasonably priced valve, consider the MONOFLANGE MARK II. Full particulars are available. **Write for Bulletin 10 IX**

HENRY PRATT®

Monoflange MK-II
RUBBER SEAT BUTTERFLY VALVE

Creative Engineering for Fluid Systems

HENRY PRATT COMPANY
319 W. VAN BUREN ST., CHICAGO 7, ILL.
Representatives in Principal Cities

Kerr, Gen. Sales Mgr., Ontario Paper Co.

DAVID F. KERR has been appointed sales mgr. for Ontario Paper Co. Ltd. and its subsidiary, Quebec North Shore Paper Co. He will be located at the head office in Thorold, Ont., and will report to K. F. McGrann, vice pres., sales.

Anglo-Canadian appointments include: W. H. HURST, gen. supt., maintenance; V. F. STAPLETON, supt. of design and estimating; W. W. POTTS, consultant on woods matters; T. M. HOPKINS, formerly controller, now secretary; C. J. BOND, formerly asst. treas., is now asst. sec.

G. C. BROWN is now executive in charge of manufacturing, Price Bros. & Co., Quebec City, and H. H. SEARS is mgr., paper division, based at the Kenogami, Que. mill. . . . R. J. FLOOD has been made mgr., newsprint sales, for Consolidated Paper Sales Ltd., Montreal. J. S. OPPE is asst. mgr., with K. W. KASBOURNE mgr., orders and service. . . . R. H. BURNS, res. engineer, Abitibi Power & Paper Co. at Sault Ste. Marie, Ont., has retired after long service in the industry, starting with the old Spanish River Pulp & Paper Co. at Espanola, Ont. He was at Sault Ste. Marie since 1925. J. H. DAY has been named as his successor. He joined the division in 1946. . . . D. R. HUTTON, treas., E. B. Eddy Co., Hull, Que., has been elected to the company's board of directors. . . . GORDON F. HARRISON has taken over the position of vice pres., industrial relations, Hinde & Dauch.—Charles L. Shaw.

Robert J. Jacobs Joins John Waldron Corp.

Mr. Jacobs, who has been gen. mgr. of Black-Clawson's Dilts div., becomes gen. mgr. of Midland-Ross Corp.'s subsidiary, John Waldron Corp., and of its Hartig Extruder div.

LITERATURE

Log Stacker

A two-color bulletin (105A) describes the improved Series F 30-ton electric log stacker, pointing out such benefits as fast log handling in truckload lots, building of high decks and the ability to remove selected logs for the mill. Illustrations of typical installations show how electric power is directly applied. Other data includes a load vs. reach chart and general information pertaining to size, turning radius, etc. Contact R. G. LeTourneau Inc., 2399 So. MacArthur, Longview, Texas.

One-Piece Air Vibrator

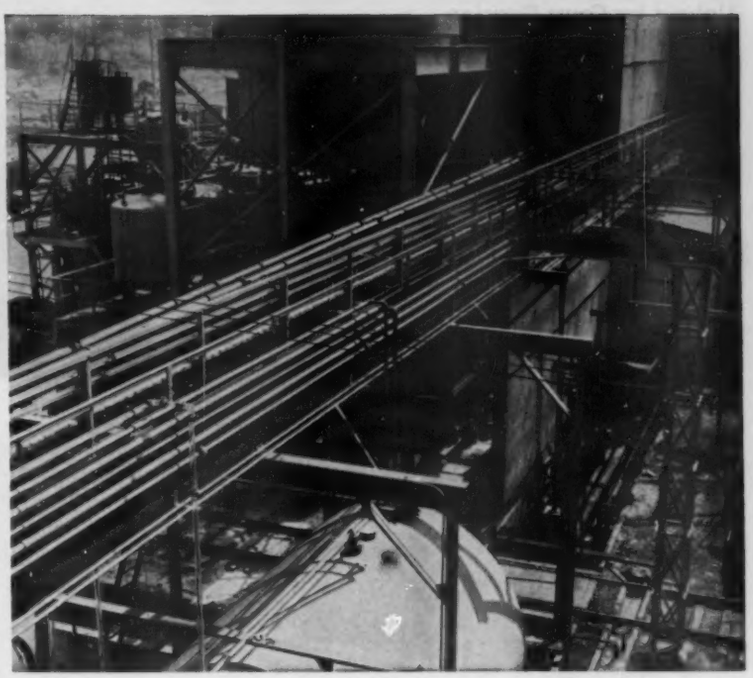
A four-page bulletin details applications of the one-piece air vibrator, used for moving bulk materials through hoppers, bins, chutes in a variety of industrial plants such as pulp mills. Units can also be arranged for bulk feeding applications. Navco models are pictured in operation under hazardous atmospheric conditions. Specifications and mounting information for eight models are included. Request Catalog 303 from National Air Vibrator Co., 435 Literary Rd., Cleveland 13, Ohio.

Modern Research, Development

Laboratories and research facilities of many types are described in a 24-page booklet. These modern operations for engineers and scientists have been designed, built and equipped by H. K. Ferguson Co. Fully illustrated, the publication describes and pictures laboratories and development complexes in the fields of basic research, nuclear research, aeronautical and missile research, special research; it also depicts auxiliary features incorporated by the architect-engineer-builder. "Research and Development Facilities for Engineers and Scientists" may be obtained from H. K. Ferguson Co., Cleveland 14, Ohio.

Vibrating Screens

What is claimed to be the largest selection of vibrating screens in the world (12 types in 212 sizes) is described in a 48-page book available from Link-Belt Co. Also contained is information on screen cloths and assemblies. The publication describes and illustrates each of the screens and foundry shakeouts as they are used to meet the needs of practically every industry. Complete tables of materials, selection data, drawings and cut-away photographs are included, as is information on accessory items. Ask for Book 2777 ("Vibrating Screens") from Link-Belt Co., Dept. PR, Prudential Plaza, Chicago 1, Ill.



TRUSCON CHEMFAST

Combats Extreme

Corrosion Conditions!

An investment in Chemfast protection now will pay you maintenance dividends for years to come. Check these Chemfast features . . . they'll save money for you!

- Contains Devran Epoxy Resin
- Resists Chemicals
- Exceptionally durable for interior or exterior
- Resists excessive abrasion
- High Operating Temperatures — Up to 350°F.
- Available in functional, morale-building colors
- Chemical resistance effective on wood, metal and masonry surfaces
- Apply by conventional methods including hot spray

Truscon qualified representatives will provide prompt inspection, color guidance and consultation without obligation.

TRUSCON Laboratories
Industrial Maintenance Division of Devoe & Raynolds Co., Inc.
Detroit 11, Michigan

Scapa Dryers' Plant in U. S. Upheld by Court Decision

In the litigation pending between Scapa Dryers, Inc. of Waycross, Georgia, and Abney Mills of Greenville, South Carolina, the United States Court of Appeals for the Fifth Circuit has unanimously reversed the judgment rendered last February in favor of Abney Mills and directed the entry of a judgment in favor of Scapa Dryers, Inc.

The judgment which the Court of Appeals reversed had enjoined the Hindle-Scapa interests from using or operating Hindle looms in the manufacture of dryer felts in this country. The effect of the reversal is to confirm the right of Scapa Dryers, Inc. to continue to operate and to enlarge the capacity of its plant located in Waycross, Georgia, which has been supplying Scapa Dryer Felts woven in Hindle looms to the U.S. paper industry since 1956.

East Texas P & P Adds Laminator

. . . at its Evadale, Texas plant. The Inta-Roto combination unit permits either laminating and coloring or laminating and printing one color in the same operation. Eastex is currently laminating foil, greaseproof and board-to-board using its own Fourdrinier and cylinder board as a base web. Laminating agents are heat-resistant aqueous adhesive and microcrystaline wax. The new equipment includes a drying tunnel, a sheeter and layboy for 69- by 72-in. maximum size sheets as well as a rewind for 70-in. wide and 58-in. dia. finished rolls. Bill Burgess (1), supervisor of converted products, points out new innovations to Bob Wicklund, carton board sales mgr.

O-I Develops New Corrugated Board

Perfection of a new and stronger type of C-flute corrugated board has been announced by Owens-Illinoise Glass Co. The new board—called O-I C-flute—is said to achieve up to 17% greater resistance to flat crush than ordinary C-flute through a change in the design of the contour.

The development is being made available to other firms.

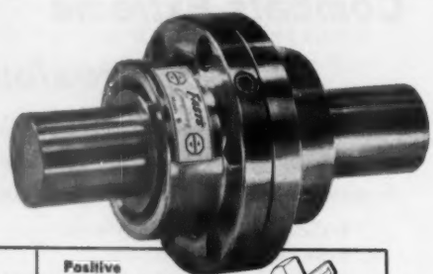
Vacuum Discharge Patented for Centrifugal Cleaners

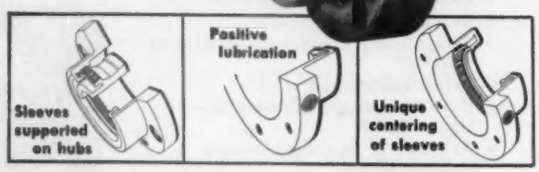
The use of vacuum at the reject discharge of centrifugal cleaners has been covered by a U.S. patent issued to Howard Smith Paper Mills Ltd., naming George H. Tomlinson II as the inventor. Bauer Bros. Co. is exclusive licensee. Bauer applies vacuum to Centri-Cleaners at the reject orifice for many uses such as stock cleaning ahead of paper machines.

Howard Smith Paper Mills research organization, headed by Mr. Tomlinson as director of research, did the original and fundamental development work with 12-in. diam. Centri-Cleaners in 1950 and has been credited with the original invention of all vacuum applications for cyclonic rejects discharged from such vessels.

This invention is covered in Canada and other countries by similar patent applications.

FAST'S Model B Coupling





reduces downtime and upkeep for light-to-medium drives!

Now you can profit from the durability and economy of famous Fast's couplings in a smaller and lower-cost version—available in 5 sizes for shafts ½" to 3⅛" in diameter.

The Model B coupling gives you the same features that have made Fast's the world's leading coupling for over 35 years. You get the same trouble-free performance, longer service life and lower maintenance costs. You also get prompt delivery because stocks are on hand to meet practically every need. Free engineering service is also available.

Write today for more details to KOPPERS COMPANY, INC., Fast's Coupling Dept., 5109 Scott Street, Baltimore 3, Maryland.

Engineered Products Sold with *Service*

KOPPERS

THE ORIGINAL *FAST'S Couplings*

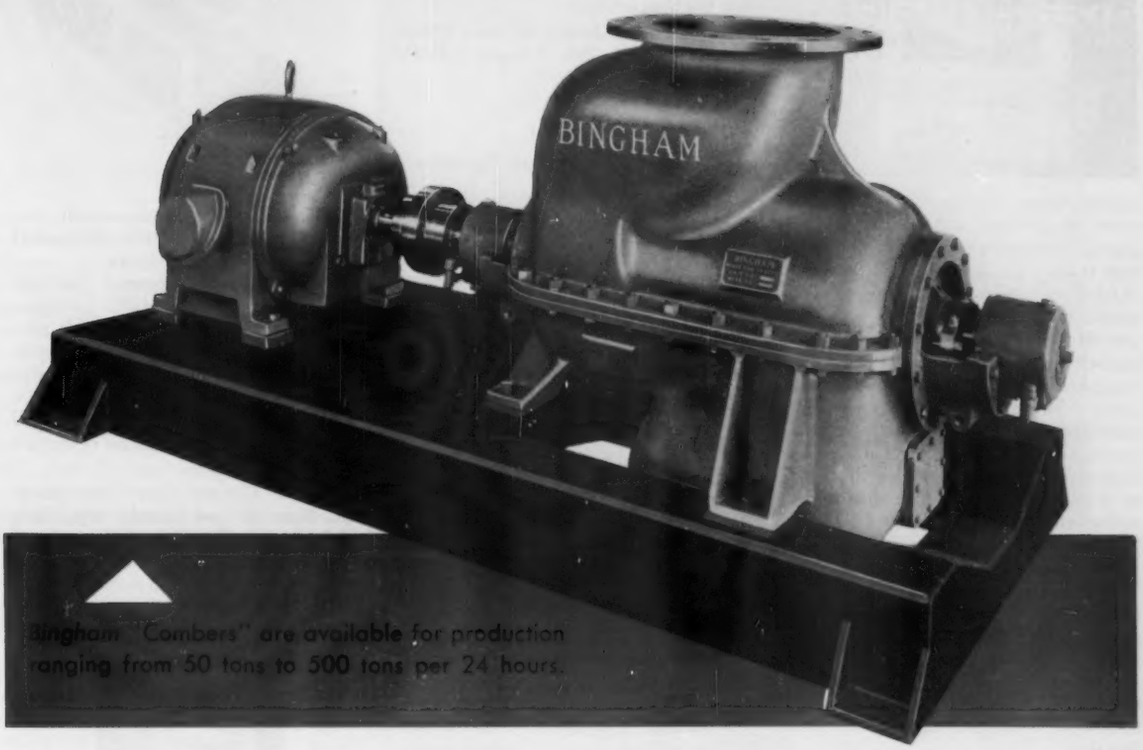
We're Sorry

There really aren't two organizations known as the American Paper and Pulp Assn. despite the fact they have been listed that way in PULP & PAPER's 1959 World Review Number.

The mistake occurred when changing the American Pulp & Paper Mill Supts. Assn. to its new name of Paper Industry Management Assn. It is this latter organization (PIMA) which Mr. A. C. McCorry now heads as president.

Bingham "COMBER"

"IT COMBS AND MIXES"



Bingham "Combers" are available for production ranging from 50 tons to 500 tons per 24 hours.

The Bingham "Comber" is designed to comb individual fibres from fibre bundles without cutting, bruising, or hydrating the fibre. In addition, this special equipment thoroughly mixes the pulp fibres with any added chemical. This combined action establishes a definite place for the "Comber" in the chemical treatment of pulp fibre for production of high quality pulp.

The Bingham "Comber" has other important applications such as separating fibres from knots in blow-pit stock and combing out the fibre bundles which persist through the processing usually applied to the de-fibering of lap or baled pulp and old paper stock.

The Bingham "Comber", in a stock line, does not increase the head loss in the system. This special equipment performs its combing and mixing action, and, at the same time, creates sufficient head to compensate for all head losses. Due to its high operating efficiency, the "Comber" requires but a minimum of power.

Your nearest Bingham office will be glad to give you full details on request.

Bingham SINCE 1921

DOUBLE VOLUTE PUMPS RADIAL BALANCE

BINGHAM PUMP COMPANY

General Offices: **2800 N. W. Front Avenue, Portland 10, Oregon**

Factories: **Portland, Ore. • Vancouver, B. C., Canada**

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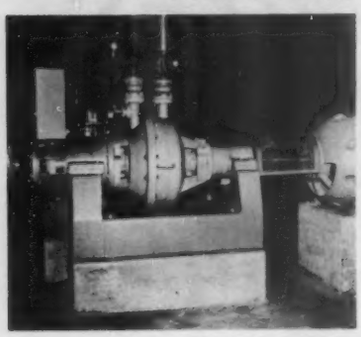
DALLAS, TEXAS	SAN FRANCISCO, CALIF.
DENVER, COLO.	SEATTLE, WASH.
HOUSTON, TEXAS	ST. LOUIS, MO.
KANSAS CITY, MO.	ST. PAUL, MINN.
LOS ANGELES, CALIF.	TULSA, OKLA.
NEW ORLEANS, LA.	TORONTO, ONT., CAN.
VANCOUVER, B. C., CAN.	

New Equipment Section

Pump-Through Refiner

. . . for Small Mills



Applications: For a wide range of stock preparation and special fiberizing applications at small and medium-size mills.

Advantages: The 24-in. pressure type single revolving refiner with a 50-ton per day capacity is said to offer high capacity at relatively low power consumption and minimum operating costs. The unit can be supplied with standard manual, automatic or remote controls for quick control of plate clearance to compensate for the type of stock desired, and to assure maximum uniformity in refining.

Specifications: Stock flow is regulated by a stock valve on the discharge line. The slow-speed rotating disc is so located between the bearings that the discs would remain parallel even with shaft deflection. A one-piece steel weldment base minimizes thermal and mechanical stresses and prevents distortion or misalignment of shaft and bearings.

Supplier: **Bauer Bros. Co., 1706 Sheridan Ave., Springfield, Ohio. Tel: FA 3-5501; Enso-Gutzeit Oy, Mannerheimintie 12, Helsinki, Finland, and Maskinaktiebolaget NA Eie, Postbox 7, Stockholm-Bandhagen, Sweden.**

Proportioning Pump

. . . Complete Package Available

Applications: For positive control of materials in motion.

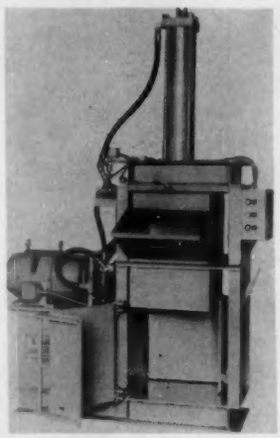
Advantages: This electrically-driven, positive displacement unit features a corrosion-resistant transparent plastic head, Hypalon diaphragm and check valves and straight-through flow design. It is said to accurately and uniformly proportion chemical solutions, acids and alkalis to process water in industry.

Specifications: The pump is available in three models (Simplex, Duplex and Triplex) for adjustable, wide-range proportioning up to 12, 24 and 36 gph with discharge pressures of up to 125 psi. Complete package ready for installation includes Chem-O-Feeder, motor, suction and discharge tubing, injection nozzle, foot valve, tools and spare parts. Prices start at $285.00 for the Simplex unit.

Supplier: **B-I-F Industries Inc., Providence 1, R. I. Tel: GAspee 1-4302.**

Packing Press

. . . One-Man Operation



Applications: For compacting loose bulk materials such as sawdust, wood shavings, pulp, etc. into corrugated cartons.

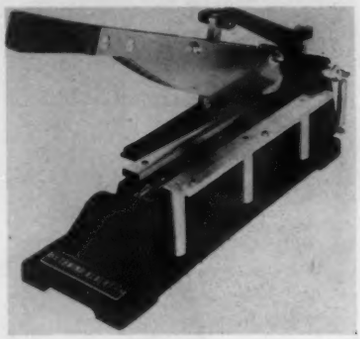
Advantages: It is said that the Carton Packer will appreciably reduce manpower requirements, reduce cost of wrapping materials and speed up the packaging of the various materials. Materials are said to be pressed under such tremendous pressure that they hold position in the carton and do not spring back for several minutes. All moving parts are completely encased. The press is protected by a series of limit switches, a pressure relief switch and a pressure switch.

Specifications: The all-steel weld constructed unit is powered by a 10-hp electric motor and an automatic self-contained hydraulic power package. Overall height is 8 ft. 9 in., the length 45 in., the width 31 in. and the weight 2,075 lbs. The carton produced by the standard unit measures 20 in. by 20 in. by 20 in.

Supplier: **Lake Engineering Co., 312 Gostlin St., P. O. Box 784, Hammond, Ind.**

Precision Sample Cutter

. . . Accessory Platform, Guide



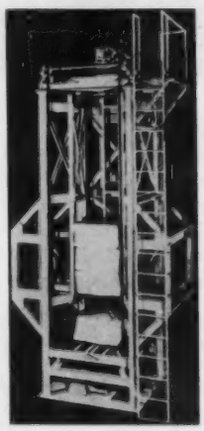
Applications: For simultaneously preparing samples for the Elmendorf tester and the tensile tester.

Advantages: The accessory platform and guide for the JDC precision sample cutter is said to make it possible to cut precision tensile tester samples and Elmendorf tearing tester samples at one time. It eliminates the necessity of having two cutters. All existing JDC cutters can be equipped with the accessory.

Supplier: **Thwing-Albert Instrument Co., Penn St. and Pulaski Ave., Philadelphia 44, Pa. Tel: GErmantown 8-5720.**

Pulp Bale Stacker

. . . Entirely Automatic



Applications: For stacking bales of pulp for fork truck pick-up or ship and/or barge loading.

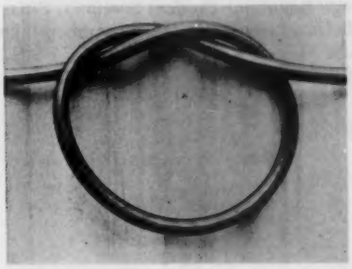
Advantages: The stacker—entirely automatic—receives bales one at a time, elevates and holds them until a stack of predetermined number has accumulated. The unit then discharges the stack for fork truck pickup. Manual

control push buttons are also available for testing or other purposes.

Supplier: **Lamb-Grays Harbor Co. Inc., Hoquiam, Wash. Tel. GEneral 8-1000.**

Heat Exchanger Tubing

. . . Five-Year Test



Applications: For use in boiler, water wall, supply, riser, superheater, economizer, reheater and attermperator applications within the limits of manufacturing and temperatures to which carbon steel seamless tubes may be subjected.

Advantages: The Lectrosonic line was developed to meet the need for an electric resistance welded carbon steel tube of uniform strength, dimensions and properties that is easily workable and less costly than seamless tubing. Weld flash—or bead—has been automatically removed from the entire length of the tube during fabrication. This is said to improve corrosion resistance and flow properties. It also permits alteration of tube length in the field.

Specifications: The tubing is produced to ASTM specifications A-214 and A-334 Grade C and identical ASME specifications. It is produced in a complete range of sizes through 4½-in. outside dia. and in all normally required standard wall thicknesses. Lectrosonic tubing is operating in service in boilers at pressures as high as 2,700 psi.

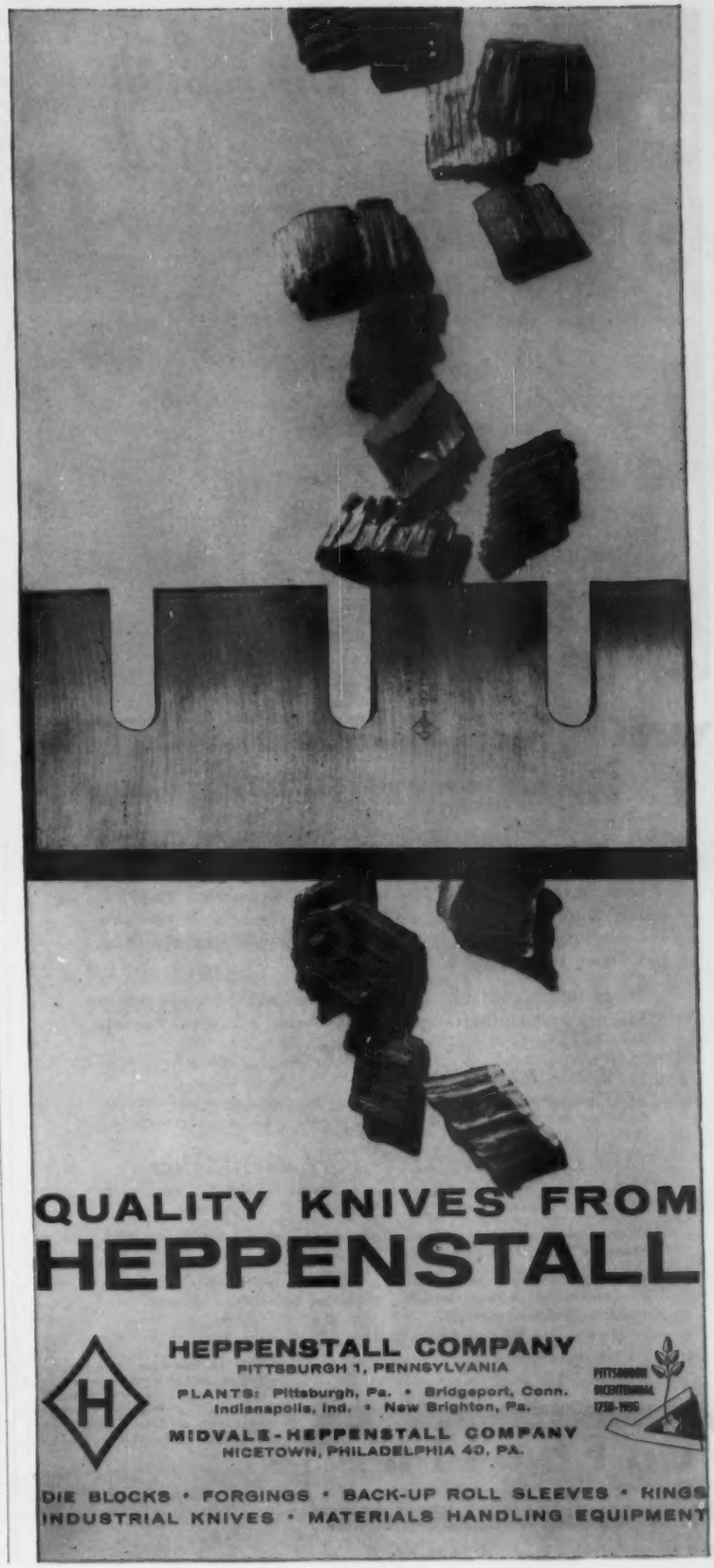
Supplier: **Babcock & Wilcox Co., 161 East 42nd St., New York 17, N.Y. Tel: MU 7-6700; and Babcock & Wilcox Ltd., Babcock House, 209 Euston Rd., London N. W. 1, England.**

Voltage Regulator

. . . For Single-Phase Loads

Applications: For handling single-phase loads of up to 8.5 kva and 100 amperes.

Advantages: The rack-mounted Inductrol unit features no brushes, is said to introduce no harmful wave form distortion and is unaffected by power factor, frequency or load. Controls are drift-free and maintain ±1% bandwidth accuracy over a temperature


QUALITY KNIVES FROM
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HEPPENSTALL COMPANY
PITTSBURGH 1, PENNSYLVANIA
PLANTS: Pittsburgh, Pa. • Bridgeport, Conn.
Indianapolis, Ind. • New Brighton, Pa.
MIDVALE-HEPPENSTALL COMPANY
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DIE BLOCKS • FORGINGS • BACK-UP ROLL SLEEVES • RINGS
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with CARBOMASTIC

heavy duty epoxy-tar coatings

Generally, with protective coatings, undercutting begins at a damaged surface and corrosion progresses beneath the coating film. This corrosive loss can be prevented by priming with Carbomastic #3 — unique because it contains inhibiting pigments. In addition, it features good surface wetting and outstanding adhesion.

These tough coatings are economical, too . . . providing lasting protection for less than 1¢ per mil foot. Recommended Carbomastic applications are:

OUTDOOR MAINTENANCE

An all epoxy-tar system, with excellent weathering characteristics and high resistance to water and brines. Use Carbomastic #3 and Carbomastic #5 (topcoat). Color: aluminum.

TANK LININGS AND HEAVY DUTY MAINTENANCE

High resistance to hot water, brines, sour crudes (hydrogen sulfide), acids and alkalis. Use Carbomastic #3 and Carbomastic #2 (topcoat).

Where color topcoats are desired, Carbomastics may be coated over with Phenoline 305 or Carboline Epoxy 150.

WRITE TODAY for Technical Bulletin #803, containing complete information on Carbomastic coatings, including suggested applications, general characteristics and testing results.

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carboline COMPANY

Coatings with Paper & Pulp Experience

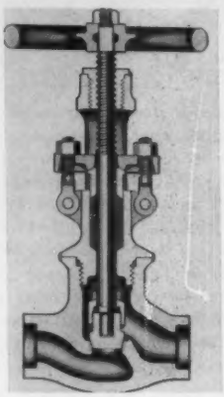
32-O Hanley Industrial Ct., ST. LOUIS 17, MO.

NEW EQUIPMENT

range of −60° to +60°C.
Specifications: The compact 19-in. rack-mounted unit is available either automatic or motor-driven. They are built to MIL-E-16400 and MIL-E-4158.
Supplier: **General Electric Co. (Voltage Regulator Product Section), Pittsfield, Mass.; and GE Co. Ltd., Magnet House, Kingsway, London W. C. 2, England.**

Bonnet Valves

. . . Redesigned and Expanded



Applications: For pressure piping service.
Advantages: The line of lip-seal bonnet valves has been revised and expanded to cover three distinct pressure-temperature classifications. The units now provide a centering shoulder to eliminate any possibility of stem binding, etc. The seal weld is laid on a flat surface and can be ground off easily. Valves have two-seat ball-joint glands that are said to make binding or galling impossible. The stuffing box holds nine to 11 rings of packing.
Specifications: The valves range in size from ½ in. through 2 in. The 3800 Series—1,500-lb. valves at 850°F; 3900 Series—1,570-lb. valves at 1,050°F, and 4000 Series—2,520-lb. valves at 1,050°F.
Supplier: **Crane Co., 836 So. Michigan Ave., Chicago 5, Ill., Tel: WAbash 2-3123; and Crane Co. Ltd., 15-16 Red Lion Court, Fleet St., London, England.**

Paper Knife

. . . Finely Ground, Finished

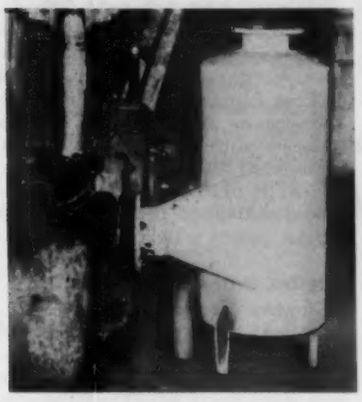
Applications: For trimming paper.
Advantages: Boltoloy knives are said to combine quality and a competitive price. The high-speed knife has been heat-treated and finely ground and

highly finished to extremely close tolerances.

Supplier: **John W. Bolton & Sons Inc. (Emerson Mfg. Co. Div.), 9 Osgood St., Lawrence Mass. Tel: MUrdock 6-6171.**

Water Separator Snubber

. . . Tests at Wisconsin Mill



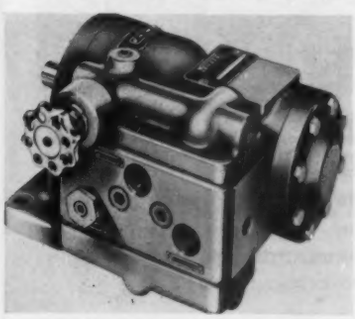
Applications: In a water-sealed vacuum pump installation, to serve as both water separator and as a silencer when the noise is excessive or objectionable.

Advantages: During the installation of a vacuum pump at a Wisconsin paper mill a series of tests was made to determine the efficiency of the unit in reducing the pump's discharge noise. The water separator snubber was then installed, and tests showed an attenuation of 18 db in the overall noise level. Fundamental frequency was said to have been reduced 12 db. Water separation at 28 gpm was claimed to be entirely satisfactory.

Supplier: **Burgess-Manning Co. (Industrial Silencer Div.), 9207 Sovereign Row, Dallas 35, Texas.**

Two-Volume Pump

. . . Prevents Wasted Horsepower

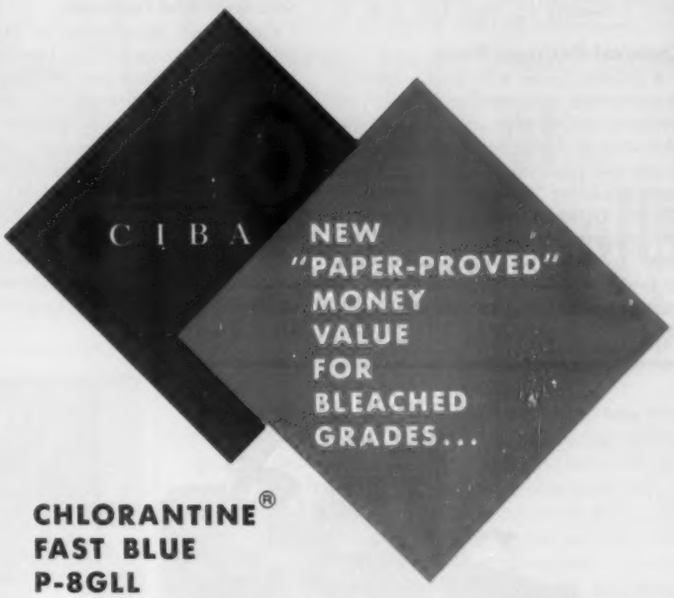


Applications: For use particularly with long runs of tubing or flexible fluid conduit.

Advantages: The unit requires only a single pressure setting for both unloading and maximum pressure. It is said to prevent excessive heat generation and wasted horsepower by automatically maintaining system pressure with a small-volume pump, while a fixed differential between the relief valve setting and the unloading valve allows return of large-volume pump capacity to the reservoir at negligible pressure. Unloading response is said to be three times faster than with previous two-adjustment models.

Specifications: Pumps incorporating the new feature are recommended for 1,000 psi at 1,200 rpm in the small-volume operation and up to 750 psi at 1,200 rpm in the larger volume operation. Two pump groups are provided: one with 18 combinations of the small pump cartridges with capacities at operating pressure of 4.0 to 21.4 gpm for large-volume operation, the other with 30 combinations of the small and large pump cartridges with capacities at operating pressure of 14.7 to 45.2 gpm for large-volume operation.

Supplier: **Vickers Inc. (division of Sperry Rand Corp.), 1400 Oakman Blvd., Detroit 32, Mich. Tel: TOwnsend 8-5100.**

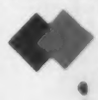


CHLORANTINE® FAST BLUE P-8GLL

Mill usage of this bright attractive color in bond, offset, mimeo and manifold grades produced from bleached sulphite, bleached neutral sulphite semi-chemical and bleached sulphate pulps has repeatedly shown marked economy in formulations for blue and green shades.

Chlorantine Fast Blue P-8GLL is somewhat greener in shade than our Direct Brilliant Sky Blue P-6B Ex. Conc. Its shade and strength permit partial replacement of the more expensive Alizarine Sapphire Blue types to effect appreciable economy without undue loss of brilliance.

Chlorantine Fast Blue P-8GLL possesses excellent light fastness, good fastness to water, acid and alkali, and is easily discharged with hypochlorite solutions. It is recommended for dyeing appealing blue shades of good brilliance on specialty converting papers ranging from tabulating card and file folder stocks to facial, facial toilet and napkin tissues.



We shall be pleased to furnish information on mill-proved formulations showing marked cost reduction over dyes in general use for many blue and green shades.

CIBA Company Inc., Paper Chemicals Department
Fair Lawn, New Jersey

CHEMICALS COLUMN

New Latex for Coating

Darex Latex C is a new latex for paper coating that is said to control the rheological or flow properties of coating colors. This makes possible the production of coatings with exceptional low pattern at higher solids content than was previously possible. Much credit for the development is attributed to the use of a new type high-shear viscometer designed especially for Dewey & Almy by Dr. Edward W. Merrill of the Massachusetts Institute of Technology. A commercial model is being developed by Brookfield Engineering laboratories, Stoughton, Mass. For further information on Darex Latex C, contact W. R. Grace & Co. (Dewey & Almy Chemical div.), 3 Hanover Sq., New York 4, N. Y.

Chemical-Resistant Resin

A polyester resin with certain end-use characteristics approaching those of epoxies is said to offer advantages in the fabrication of chemical-resistant tanks and in pulp and paper applications where corrosion is a factor. The special properties of ATLAC L-382-13 become important in applications where conditions such as elevated temperature or corrosion cause physical, chemical or electrical failure in normal polyesters. Further information can be obtained by contacting Atlas Powder Co. (Chemicals div.), Wilmington 99, Del.

New Liquid Dye

Green MX Liquid has been added to American Cyanamid Co.'s line of liquid paper dyes. The new product is said to be specifically designed to eliminate the dusting and handling problems that result from the use of some powder types. The dye may be added to the water being fed into the preparation tank or directly to the mixing chest. With either addition, Green MX Liquid is said to be quickly and uniformly distributed throughout the fiber mass.

Stabilizer and Thickener

Commercial introduction of Natrosol 250 has been announced by Hercules Powder Co., Wilmington 99, Del. The water-soluble stabilizer and thickener is said to have application in paper coatings and sizes. It is a nonionic hydroxyethyl ether of cellulose and is available in four viscosity types, one of which is claimed to be the highest available for this type chemical. Natrosol 250 is available in granular form and has good compatability with gums and latices. The chemical is being produced at new facilities in Hopewell, Va.

New Dow Facilities

Production of propylene oxide, propylene glycol and dipropylene glycol is underway at new plant facilities recently completed at Plaquemine, La., by Dow Chemical Co. The firm is the only chemical producer turning out these products at more than one location.

Stein, Hall Research Expands

Stein, Hall & Co., Inc. reports expansion of its adhesive research and development facilities with installation of a paper gumming, coating and laminating machine at its Long Island City, N. Y. laboratories. The company is broadening its program in remoistenable, heat sealable, barrier, hot melt and other specialty coatings. The machine is patterned on standard commercial coating and gumming equipment and can process a 10-in. web.

Stauffer, Victor Plan Merger

Directors of Stauffer Chemical Co., New York, N. Y., and Victor Chemical Works, Chicago, have reached an agreement in principle for a merger of the two firms. The action is subject to stockholder approval. The proposal provides for an exchange of one share of Stauffer common for each share of Victor common. Victor's extensive operations in phosphates and allied products will complement Stauffer's position in basic industrial and agricultural chemicals.

Here's another order of ALASKAN Stainless Steel pipe being prepared for shipment.

STAINLESS STEEL PIPE & FITTINGS
. . . for the Pulp and Paper Industry

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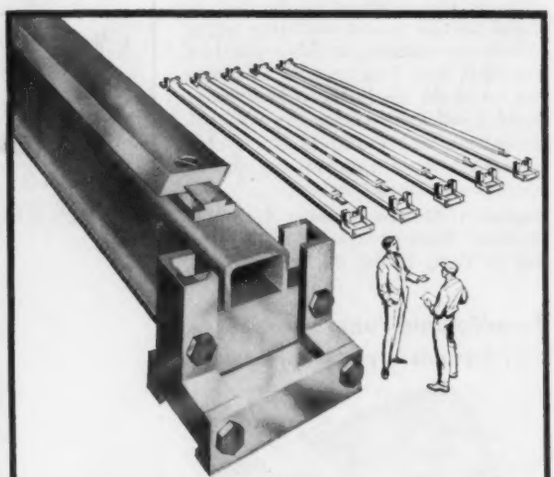

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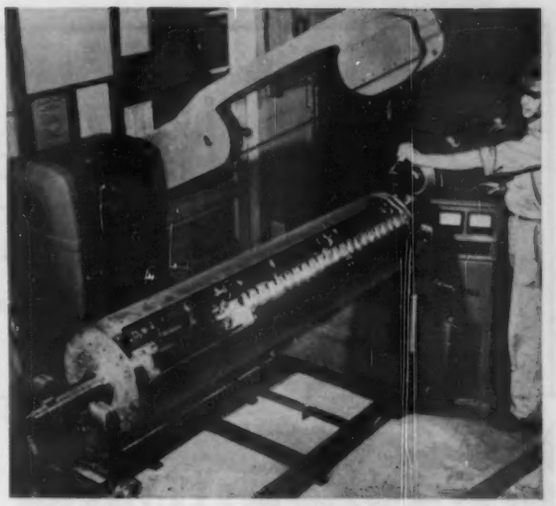

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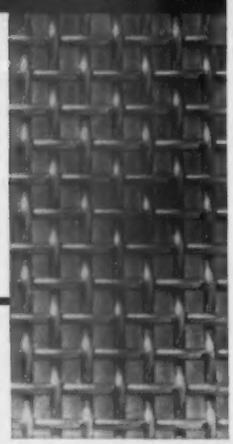

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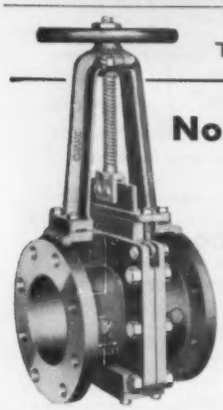

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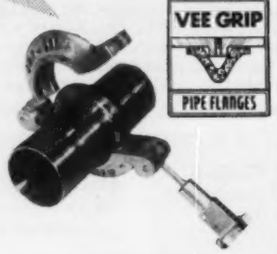

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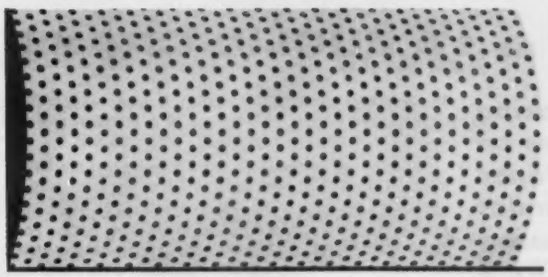

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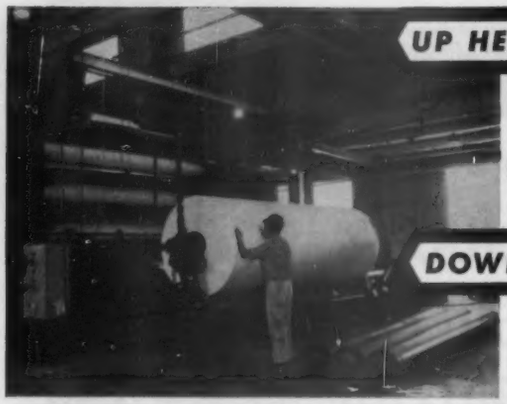

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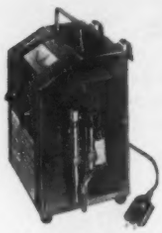

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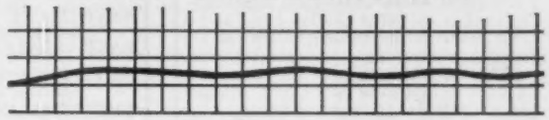

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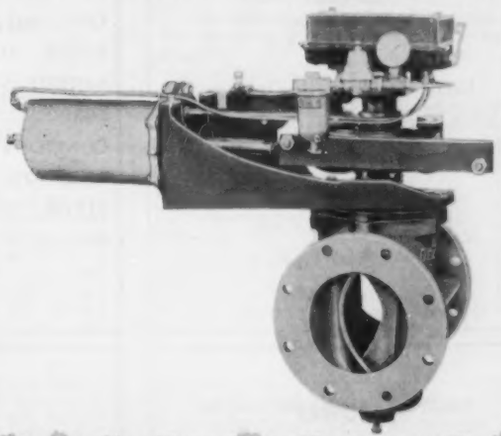

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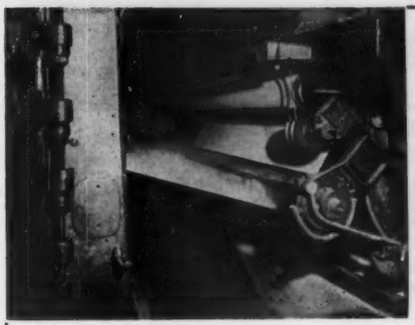

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The Last Word — PULP & PAPER — Editors' Page

PULP & PAPER Editor Travels by Cargo Plane

Louis H. Blackerby, Western editor of PULP & PAPER, recently had a new experience when he flew from Portland, Ore., where his headquarters are located, to Klamath Falls, Ore., in a cargo plane for the dedication of a new Johns-Manville fiberboard plant in the latter city.

Mr. Blackerby is the gentleman in the light suit and hat on the right. Helping him into his parachute, necessary equipment on the cargo plane flight, is John E. Bennett, Portland district manager for American Forest Products Industries, Inc., another guest.

Mr. Blackerby's story on Johns-Manville will be appearing in a near future issue.

Even though he has had all kinds of experiences in the Far Western forest industries field in his nearly 20 years of serving PULP & PAPER readers, this was a new one for our Mr. Blackerby. He is a 1939 graduate of the Forest School at Oregon State College, where he was elected to two scholastic honoraries, and he has covered all phases of the Far Western industry with camera and typewriter.

About Profits and Abundance

By SAMUEL LENHER, Vice President, The DuPont Co.

The partnership of science and industry is generating a striking advance in human welfare. Since each supports and stimulates the achievements of the other, we are witnessing an accelerating march of progress throughout the world and strikingly in the United States. Nearly every scientific discovery is translated by industry into technology and products valuable to mankind. Nearly every advance in technology suggests to science a further trail to be explored.

The most profound scientific discovery is of little benefit to mankind unless it can be made to serve a useful purpose. It is here that industry steps in, for the objective is to find something useful to mankind that can be produced commercially.

Whether the objective of industry is profit or human welfare is quite an unimportant as whether the chicken or the egg came first. To earn a profit, it is imperative for industry to provide a product or service which people desire at a price they are willing to pay. Without profit, it is impossible for any component of industry to survive, whether it be the one-man store or the largest corporation.

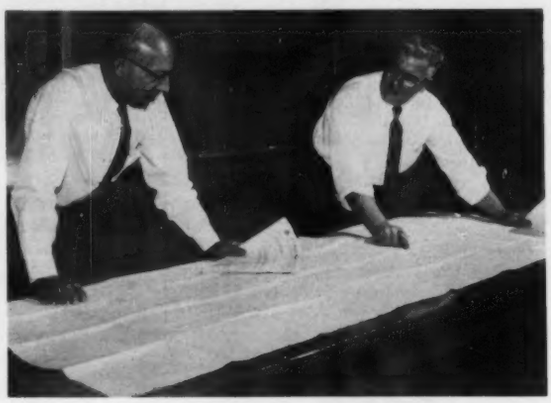
If it is to stay in business, any company must pay high enough wages and salaries and it must get the money for plants, machinery, and working capital. It must make a profit if it expects to get the money for that purpose.

Since the beginning of the century, industry has increasingly turned to science in its search for ways to operate at a profit. The yield from this partnership of science and industry is an economy of unprecedented abundance, instead of scarcity.

Reformers, politicians, and others frequently claim credit for the shorter workweek and other social gains. While their contributions are considerable, it is nevertheless true that social gains are only made possible by abundance, and abundance has never been created by law.

The next 10 years should be a thrilling decade. It is plainly evident that industry is working on more new products and new processes than at any time in history.

They Knew It pays to advertise but . . .



More than six feet of engineering prints arrived one day at the Englewood, Colorado plant of C. A. Norgren. They created quite a stir. With the blueprints were the largest inquiry ever received by this manufacturer of lubrication systems. It was unusual too, to receive blueprints in response to an ad.

There was quite a stir too, in the offices of PULP & PAPER. The inquiry was the direct result of a full-page, two-color Norgren ad that appeared in a recent issue of this publication. The ad made sense to a large Midwestern machinery manufacturer, and off went a letter to Norgren. The manufacturer wanted a quotation on Norgren Micro-Fog lubrication equipment to serve the nearly 300 bearings in the dryer section of the paper machine depicted in the diagram.

Obviously, Norgren got busy. Shown here poring over the print are Wally Stalder, Norgren's advertising manager and his assistant, Bob Sutherland, in sales promotion.

PULP & PAPER is proud of this influence carried by its advertising pages. According to Norgren, the inquiry followed a record-breaking four-month total of requests for information and quotations. This, they say, was due directly to advertising and new product publicity. Norgren reports a 57% gain over last year with 1,807 inquiries received.

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